The role and function of e-mail as a form of computer mediated communication for research purposes: a comparative study

by

Suzette Oosthuizen STLSUZ002

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Department of Information and Library Studies
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Supervisor: Mrs J. G. Smith

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Declaration

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

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ABSTRACT

The use of Computer Mediated Communication (CMC) is seldom questioned in the First World, as it is perceived as being one of the components of everyday working life. It contributes towards research and communication within higher education institutions. With regard to the South African context, the question arose whether the application of CMC in Historically Disadvantaged Institutions (HDI's) within the specific area of the Eastern Cape, is on a par with that at Historically Advantaged Institutions (HDI's) in the same region. The University of Fort Hare represents a typical HDI and the University of Port Elizabeth a HAI.

To investigate the use of CMC the researcher adopted the survey technique as most suitable for this study. The investigation included both descriptive and exploratory elements, and certain characteristics of comparative studies. It attempted furthermore to provide an initial and preliminary understanding of e-mail use by academics at the Universities of Fort Hare and of Port Elizabeth respectively. The responses obtained from the academics at the two institutions were compared to establish whether there were any variances between the two institutions' use of CMC. Secondary data derived from a literature overview of the development of CMC and an overview of the UFH and the UPE. Primary data were collected by means of a questionnaire (closed-ended questions) and follow-up interviews. The Statistical Package for the Social Sciences (SPSS 10) was used to analyse the data. Qualitative data analysis by means of non-parametric statistical methods such as percentage tables described the situation and 2x2 cross-tabulations were used to analyse and compare variables. The majority of the results pertain to qualitative data. In the instances where quantitative data were collected, parametric methods were applied and tables indicating averages and standard deviation were produced. From the results it was clear that generally speaking, e-mail was used mostly for routine purposes. The UPE respondents used e-mail significantly more to communicate with students. At the UFH e-mail was used more to communicate with colleagues, than at the UPE. That e-mail was regarded as a valuable tool for research purposes, was clear. It was also used extensively to communicate with colleagues at institutional-, national,-, and international level but less so at the scholarly network-level. The main purpose for this interaction in all instances was to exchange information. At the UFH the use of e-mail for communication with colleagues at the institutional and national level was significantly higher than at the UPE. At the UFH, there

was a stronger indication of institutional communication as well as 'networking' for research purposes than at the UPE.

This study contributes towards the clarification of the use of CMC by academics at two sites in the Eastern Cape and assists in determining to what extent e-mail is utilised in the academic work environment of the Universities of Fort Hare and Port Elizabeth.

CHAPTER 1

INTRODUCTION AND OVERVIEW

1.1 Introduction

This comparative study will focus on the place, role and function of e-mail as part of computer mediated communication at the University of Fort Hare and the University of Port Elizabeth.

The last decade has seen a proliferation of information technology (IT) in higher education institutions in South Africa. Vast amounts of money have been expended to acquire personal computers and the establishment of a networked environment. Many universities thus have local area networks (LAN) in place. Current trends in information technology development indicate that computer mediated communication systems can be expected to increase progressively and become more versatile, widespread and significant both for work and educational purposes in these institutions.

Technology has revolutionised the way we communicate and work. One of the early applications of computer mediated communication (CMC) was access to and use of electronic mail. Agada (1994:258) noted that the 'information transfer cycle' encompasses the flow, distribution, developing and utilisation of new ideas towards the solution of specific problems or research questions. This 'information transfer cycle' could be improved in various ways through the use of IT such as CMC. He further elaborated that CMC adds a new scope to information transfer.

"It enables participants to solicit and retrieve information customized to their unique needs. In international information transfers for instance, CMC could ameliorate the problems of imbalance in information flows and irrelevance of content. By facilitating dialogue, the potential for diffusion and effective utilization of information is increased" (Agada, 1994:258).

The development of information technologies not only contributed towards the establishment of the global village, but also enables the 'villagers to talk to one another'. An important aspect of electronic mail is its application of IT to enhance communication.

In the academic world it is a well-known fact that communication is the 'heart of scholarly discourse' (Garvey, 1979:126; Osburn, 1989:278; Harrison & Stephen, 1995:595). In higher education institutions communication technology has become an important component of teaching, research and administration. The IT revolution created a communication tool that has made worldwide communication possible. This specific tool does not only facilitate dialogue but has changed the way we communicate worldwide.

The workplace is continuously adapting to this new communication environment and all activities will depend, amongst others, on optimal usage and application of this technology. In order to benefit from the new technology there needs to be an appropriate infrastructure, as well as human resources - well trained and sufficiently informed - to utilise and apply the technology. Users who frequently use this technology tend to acquire more knowledge of its functions and its applications. Komsky (1991:310) noted that regular e-mail users are thus more open-minded about system problems. E-mail users accept that electronic mail facilitates communication and there is a tendency amongst them to teach other users how to use it.

Komsky (1991:310) further stated that various studies on the use and application of e-mail have been documented in the literature. Examples included a study about a general profile of e-mail users and the preferences for an e-mail system in a typical university environment. Hiltz and Johnson (1990:739) had, in turn, concentrated on user satisfaction with computer mediated communication systems and offer a more general perspective on this aspect. A number of authors had, however, commented that little research existed on the impact and use of CMC by academics for research purposes (Nantz & Wilkens, 1995:196; Cohen, 1996:41; Bridges & Clement, 1997:110). Walsh and Roselle (1999:22) also noted that "while there have been numerous publications discussing the potential of computer networks to revolutionise scientific work, there have been a fairly limited number of empirical studies that attempt to measure the impact of this new technology". It should further be noted that all the above-mentioned studies focused on the use of communication technology in the First World.

Focusing more on communication technology in South Africa, it was found that hardly any research has been documented on communication technology, its application, and the use of electronic mail in the academic environment and research related purposes. This is particularly true for Historically Disadvantaged Academic Institutions (HDIs). A factor that would impact on e-mail use in South Africa is the well-documented disparity in resources between Historically Advantaged (White) Institutions (HAIs), and Historically Disadvantaged (Black) Institutions (HDIs) in the academic environment (Habib, 2001:25). These institutions are characterised as being black or disadvantaged in view of South Africa's past political structures, which led to the establishment of different academic institutions for the different population groups. The impact of this ideologically-biased guiding principle is still impinging on the role and functioning of these institutions with regard to tertiary education in South Africa.

With the return of South Africa to the international arena, the need to participate in the advances of the information era must be emphasised, as this can play a significant role in the establishment and development of research. Naude (1995:1-15) was one of the first persons to conduct research on the use and acceptance of e-mail as communication medium among academics in South Africa. In her 1995 report she pointed out that although the implementation and acceptance of interactive communication media in organisations had become accepted practice in many parts of the world, in South Africa it was still lagging behind due to a poor electronic infrastructure. Naude's research further indicated that, by 1995, electronic mail had been accepted on a small scale by academics at only four HAIs. Van der Westhuizen and Miller (1995:299), however, reported in the same year on the successful use of electronic communication methods by the Veterinary Science Library of the University of Pretoria. The main purpose was to provide information and to communicate by means of the Internet with their users in South Africa and even beyond the borders. This led to the development of an electronic forum (Listserv) that provided a discussion and information exchange platform through a ROMINFO network to academic as well as practicing veterinarians.

Agada (1994:258) further noted that in African countries north of South Africa the establishment and application of CMC is slow. In developing countries, institutions tend to work in isolation because of inadequate IT infrastructures. There is hardly any contact with other academics within their own countries and even less with academics in other parts of the

world. He also noted that this situation affected the productivity of their universities. He further implied that because of an inadequate infrastructure, the research capability of African universities had 'declined' by 50% in the last ten years.

It came as no surprise that Chowdhury (1998:1-3) indicated that the resolution of the information and communication needs of researchers rely heavily on a number of factors such as: (i) the ability to retrieve and evaluate reliable information; (ii) obtain and evaluate the information from a wide array of sources; (iii) partnership in research; (iv) debates and conferences; and (v) disclosure of research findings to potential readers/users through the right channels and media.

Adam (1995:299; 1996:135) and Chowdhury (1998:2) both quoted Adedej (1986), who identified the following possible reasons for the slow development in general in Africa. Adedej referred to them as the seven 'D' factors: 'demography', 'desertification', 'drought', 'dependency', 'disequilibrium', 'debt' and 'destabilisation'. These arguments, the researcher would like to suggest, could to a certain extent also be applied to the development of information technology in South African academic HDIs. For example, they are usually situated in rural and remote areas and there is high dependency on the government for financial assistance because of problems with outstanding fees. It is argued that these problems, or at least some of them, could partly be addressed through the development of a proper communications or technology infrastructure.

1.2 Problem statement and aim of the study

The use of CMC is seldom questioned in the First World, as it is perceived as being one of the components of everyday working life in such institutions. It contributes towards research and communication not only within the institution but also facilitates communication with all participants in the so-called 'global village'. In fact, there is little doubt that the use of CMC has resulted in many improvements in the developed world.

The question, however, arises whether at academic HDIs, because of their inherent backlogs in for example infrastructure, the existence and relevance of IT is given sufficient consideration. In recognition of the importance of IT, the South African government is

committing vast resources to acquiring state of the art communications and information processing technologies as part of their encouragement of HDIs to engage in more active research endeavours. This investment of millions of rands in the development of new information technology products envisages the enhancement of research and teaching. It is thus necessary that these universities justify these investments in IT to achieve their goal of education, community development, teaching and research. The question thus arises whether the application of CMC in academic HDIs within the specific area of the Eastern Cape, is on a par with the academic HAIs in the same region. The Eastern Cape is one of the least developed areas in South Africa, with an economy that is predominantly rural and agricultural, and poverty levels that are high.

It is against this background that the researcher was motivated to conduct a study on the use of CMC by academics at two sites in the Eastern Cape. This study will endeavour to establish whether CMC is utilised to its full capacity in the academic work of the Universities of Fort Hare and Port Elizabeth. The University of Fort Hare is representative of a Historically Disadvantaged Institution (HDI), and the data from this institution will be compared with that obtained from the Port Elizabeth University, which represents a Historically Advantaged Institution (HAI) to determine the level of disparity, if any, between the two institutions.

The main thrust of the study will be to establish the use of e-mail as a form of computer mediated communication (CMC) by the academic staff at the two institutions. It will specifically investigate the role and use of e-mail in the academics' research and teaching environment. It should however be clearly stated that the purpose of the research project, is not to measure the impact of e-mail use on the research output or increase of research productivity.

1.3 Identification of research questions

As mentioned above, the study seeks to establish whether the adoption of CMC has had a significant effect on the work environment of the academics at the two institutions, and to establish whether there are any significant differences between the two institutions in their application of CMC. To achieve this, the study will focus on various interrelated aspects

regarding CMC: Firstly, it will enquire into the status of CMC capacity at the two institutions. This will be followed by an examination of the academics' understanding of CMC and the extent to which they use e-mail and apply it in their work environment. Finally, the study will focus on the effectiveness of e-mail use and the effect of CMC on academic endeavour in general, and research and teaching specifically.

To achieve these objectives, the study will be guided by the following research questions:

1. What is the perceived status of CMC at the two institutions?
2. What is the competency level of academic staff with specific reference to utilising CMC applications in their specific environment?
3. To what extent and for what purposes do academics use CMC, specifically e-mail, in their work environment?
4. Are there any differences between the two institutions with regard to CMC use?

1.4 Outline of the dissertation

Chapter 1 sets the context for the dissertation. In **Chapter 2** a literature overview of CMC is given. The purpose of this overview is to elucidate the development of CMC and its role and impact in general terms. **Chapter 3** will focus more specifically on a review of the literature of e-mail as one aspect of CMC. E-mail as a form of CMC will be discussed from the perspective of its role and impact on communication and interpersonal networking. **Chapter 4** comprises of a comparison of the infrastructure, history and administration at the University of Port Elizabeth (an HAI) and the University of Fort Hare (an HDI). Generally speaking, this chapter provides a comparison of the research and teaching context or landscape of the two institutions. **Chapter 5** will focus on methodological questions regarding the determination of the status of CMC use and the role of e-mail will provide an outline of the methodology used for this study. In **Chapter 6** the relevant data, obtained through the questionnaire, will be analysed in order to identify and describe some significant trends or characteristic features with regard to the use of CMC in the research and teaching environment at the two institutions. **Chapter 7** will present a summary of the research results; the conclusions reached and finally suggest areas for future research.

CHAPTER 2

COMPUTER MEDIATED COMMUNICATION AND THE INTERNET

2.1 Introduction

This chapter provides a brief historical overview of the development of the Internet and e-mail. It further provides important contextual background for the investigation regarding the role of e-mail as communication tool within the academic work environment. The developments and certain trends regarding computer mediated communication (CMC) are also discussed.

2.2 ARPA/ARPANET

To understand the development of electronic communication in the higher education environment of today, it is necessary to discuss the development of ARPA/ARPANET, and the subsequent emergence of the Internet. The impact of the Internet and its role in the academic environment and communication patterns, although rapidly burgeoning, is still embryonic. Leiner et al. (2001:3) noted that:

> "The Internet has revolutionized the computer and communications world like nothing before…The Internet is at once a worldwide broadcasting capability, a mechanism of information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location. The Internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure. Beginning with the early research in packet switching, the government, industry and academia have been partners in evolving and deploying this exciting new technology."

There is a general perception amongst academics that the evolution of computer mediated communication started between the late 1950s and early 1960s. Moore (1994:4) and other

authors were of the opinion that the cold war between Russia (USSR) and the United States of America (USA) was perceived by some to be the main reason that motivated the United States Department of Defence to develop a network that could endure a nuclear attack.

Randall (1994:12) noted that the Advanced Research Projects Agency (ARPA) of the US Department of Defence provided the platform for computers to be connected via a network so that they could 'talk' to each other in the 1960's. From these developments a network emerged called ARPANET. The developers soon realised that their network could be used for resource sharing and the exchange of information and from ARPANET the Internet eventually evolved (Cohen, 1995:online; Notess, 1997:238; Moschovitis et. al., 1999:61-63). It is important that we take cognisance of some crucial stages within this development; in as far as it contributes to our understanding of the Internet (i.e. a network of computers).

2.2.1 Packet switching

Packet switching was designed as a flexible and reliable way of sending information between computers. Authors such as Hiltz and Turoff (1978:13) and Pride (1994:43) noted that packet switching allowed for minimal cost transmission of electronic information via networks. 'Data' from several computers in an area were collected and sent via local telephone lines. The data were packed to be transmitted over advanced and high capacity transmission lines to other cities where they were intercepted by a different computer, and sent to the correct destination computer linked to the network.

Sanford (1995:9) and Vaughan-Nichols et al. (1995:34-35) stated that the first packet switched computer network in the United States was established in 1970 by ARPANET. Moore (1994:6-8) noted that the ARPANET linked computers at the Universities of California at Los Angeles (UCLA), Santa Barbara California, University of Stanford and University of Utah in Salt Lake City so that academics and researchers could collaborate and share information. This could be seen as an early step towards the development and establishment of computer-networked communication between higher education institutions in the United States. This initial network germinated the 'Internet network' concept, connecting computers and institutions from various sites through which the worldwide phenomenon known as the Internet emerged. An important aspect of this initial network was to enable information to be transferred (communicated), even if a particular connection was

disabled or cut. Notess (1997:237-238) and Moore (1994:11-13) stated that the original concept of the ARPA / ARPANET was to develop a computer network that could withstand even a nuclear attack and still be operational. This highly specialised technology was later offered free to the world.

Moore (1994:8) indicated that by 1972, forty institutions were connected to ARPANET. Files were sent between users utilising a new communication technology - electronic mail. The developers soon also realised that a standardised communication protocol was necessary to link the world.

2.2.2 Communication protocols

An International Conference on Computer Communications (ICCC) was held in 1972 in Washington[1]. The aim of this conference was to establish common communication protocols between different computers and networks. The representatives were to come to an agreement about a standardised format that would enable all computers to talk to one another (Moore, 1994:8; Moschovitis et. al., 1999:75-76).

Sanford (1995:5) classified such a protocol as guidelines or heuristics that control how data will be delivered between different computers. Although these rules standardised the process of information exchange (communication) between computers, they did not restrict its application to a particular hardware system. The Internet Protocol (TCP/IP, i.e. Transmission Control Protocol/Internet Protocol) supported the concept of a connectionless network, that was, a network without dedicated channels. One important function was to specify how the network was to move messages and handle errors between resources.

2.2.3 Electronic avenues of communication

Cohen (1995:online) stated that early networks such as "BITNET and USENET also have played an important role in academic networks". According to Buckman (2001:online), the BITNET (Because It's Time Network) was one of the early electronic communications networks that operated before the Internet. He elaborated further that BITNET was

[1] At this groundbreaking first International Conference on Computer Communications (1972), electronic mail was introduced (see paragraph 2.6) (Leiner et al. 2001:6).

developed in the USA to link computer systems utilised by the University of Yale and the City University of New York. The European arm of BITNET created the first list server software. The aim of the list server was to provide scientists in Europe and abroad with a tool to communicate information with other colleagues. The list server was elementary but provided a mechanism for researchers to communicate. Eric Thomas created the revised Listserv in 1986 and this eventually became LISTSERV. Notess (1997:243) noted that with the advent and popularity of the Internet it soon took over and BITNET operations eventually ceased. This was also partly because it became more difficult for BITNET to operate and compete in an environment consisting of very large capacity, numerous mainframe systems and an ever increasing number of users (Stephen & Harrison, 1995:69; Notess, 1997:243).

Vaughan-Nichols et. al. (1995:32) suggested that USENET, though often confused with the Internet, was actually only one of its units. USENET wasn't really a network, but a distributed peer-to-peer message distribution system with messages similar to that of e-mail. According to Quarterman (1990:125), networks and conferencing systems that are interconnected for communication are called the matrix, or a global-network. This concept of the 'matrix 'was also quoted by December (1996:430) and Vaughan-Nichols et. al. (1995:32).

2.2.3.1 Newsgroups

Behrens (2000:41) noted that newsgroups are used by researchers with shared interests. She further described newsgroups as similar to electronic conferences. The information (referred to as postings) are intended for the entire newsgroup, and not aimed at certain individuals (December, 1996:441; Behrens, 2000:40-42). Anyone who shares the interests of the group may subscribe to a newsgroup at no cost. A new user would subscribe to a newsgroup through an Internet Service Provider (ISP). The ISP operates software called newsreader, which the user would use to access a 'posting'.

2.2.3.2 Mailing lists

The main idea behind a mailing list is that it enables one to communicate with more than one person at a time by means of e-mail (Behrens, 2000:40-42). Dern (1994:296) elucidated that e-mail can be used to compile mailing lists for groups of people with similar interests. There are many mailing lists and each group is focused on a topic, and academics may, for example,

discuss topics of mutual interest. Software systems generally used for managing lists are LISTSERV, Listproc and Majordomo.

2.3 The Internet

According to Vaughan-Nichols et al. (1995:32-35) and other writers, it is not possible to give an exact description of the Internet's development. Various authors expressed a similar viewpoint, focusing on different aspects of the development of the Internet, and the picture that emerges is varied and multi-faceted. As stated above, it is known that the Internet developed out of ARPANET and the TCP/IP tool made the connection between computers for information exchange purposes possible. The TCP/IP suite included protocols for many different networking functions, such as e-mail, remote login and file transfer. From this a network of connected computers was created and institutions all over the world were connected, and the worldwide phenomenon known simply as the Internet was born (Pride, 1994:2-3). The Internet is thus "an international network of cooperating, interconnected multi-protocol networks that support collaboration among thousands of organizations" (Sanford, 1995:20).

Cohen (1995:online) contended that the Internet has shown phenomenal growth not just in terms of numbers, but also in terms of the effect of and its impact on information technology and the dawning of the information communication period. From the humble start of ARPANET with four host computers in the late 1960s, the Internet grew to 1000 host computers in 1985 and soon bypassed this number, the extent of which can only be guessed at today, as the Internet growth appears to double every year. Universities were the initial main participants of the Internet, and by 1995, according to Cohen (1995:online), two national surveys had shown that approximately 70 percent of US institutions of higher education had connections to the Internet, and this figure was growing rapidly.

Notess (1997:238) noted that in the 1980s the cold war fears became fuzzier and government and federal agencies investigated alternative uses for ARPANET. The National Science Foundation (NSF) research agency then took over the role of the development of the Internet and its network because they realised how crucial the Internet was for scientific developments (Randall, 1994:12; Comer, 1995:68). In 1985 the NSF developed the network

NSFNet, which was to be the anchor for the expanding network, because ARPANET could not handle all the 'traffic'. Further plans included connecting researchers at 100 universities to the Internet and building a Wide Area Network that inter-linked computers to super computer centres. ARPANET itself was officially dismantled in 1990.

2.4 The World Wide Web

According to Randall (1994:7), the "World Wide Web is a convergence of computational concepts for presenting and linking information dispersed across the Internet in an easily accessible way". Sanford (1995:253) in turn stated that the "WWW is made up of thousands of interconnected pages, or documents, which can be displayed on your screen. Each page can have connections to other pages, which may be on any computer connected to the Internet."

The WWW further became possible through the employment of information retrieval software that facilitated the searching of the worldwide chain of computer databases. Further factors that enhanced its development were the creation of hypertext and hypermedia (Barron, 1994:433-437).

The WWW concept was born because Berners-Lee (an employee at the European Particle Physics Laboratory (CERN) in Geneva, Switzerland) pinpointed the problems that the high-energy physics community experienced, such as computing incompatibilities and difficulties in the access and exchange of information due to differentiation in encoding formats and networking schemes. In response, Berners-Lee then developed a language to overcome the problem of getting different people the information they needed in real time, thus enabling them to work together more effectively. This problem was solved by using hypertext mark-up language (HTML) as medium for communication. Web documents need to be written in a special format for the hypertext links to work, i.e. by using hypertext mark-up language (HTML). This is the publishing language of the World Wide Web. The software enabled people to communicate via different computers and provided them with access to the World Wide Web (Vaughan-Nichols et. al, 1995:20).

Subsequently, users of the Internet community were encouraged to write applications for the WWW. Systems such as Netscape Navigator and Microsoft Internet Explorer were created to navigate hypertext documents on the WWW (Moschovitis et. al., 1999:177). Sanford (1995:253) noted that the WWW can be regarded, for practical purposes, as a combination of systems that allows for searches in multiple documents whilst using only one interface. The WWW and all its ramifications gave rise to other possibilities in the research world, such as online real-time communication. The 'Web' now opens a world of information to all who have access to a computer and linkage capabilities. One can argue that it is now easier than ever before in history, to obtain information through the click of a mouse and in the convenience of one's home, rather than going to the local library.

2.5 Characteristics of CMC

According to Notess (1997:241), "the different categories of communications in which a computer or computer network acts as a transport mechanism is defined as computer mediated communication (CMC). One of the basic principles underlying the new technology is that it is still about communication. The human factor does not become redundant. The means of communication as such changed, but the dynamics of person-to-person communication is still a basic point of departure".

McHaney et. al. (2000:64) explained that computer mediated communication (CMC) was developed to utilise computers as a means of facilitating human communication. Obviously, the means of communication may have certain characteristics that can influence the communication process as such.

Various authors described CMC as the process through which users construct, share and send information. This was made possible by using network communication technology, which in turn transcends geographical and chronological limitations. In other words, CMC creates an electronic environment that is accessible to participants who might otherwise be separated by time and country. Computer based communication systems have gained momentum as a dialogue and collaboration tool (Hiltz & Turoff, 1978:7; Kerr & Hiltz, 1982:3; McHaney et. al., 2000:64).

In nearly all CMC applications communication is either synchronous or asynchronous. The difference between these two forms of CMC is a temporal one, and while synchronous communication implies that communication occurs simultaneously, asynchronous communication occurs as defined and needed by users. Asynchronous communication is thus not time-dependent and examples include e-mail and electronic bulletin boards. Synchronous communication, on the other hand is in real-time and a typical example is an IRC[2] chat system (McHaney et.al., 2000:64). Developments in CMC allowed for and supported both synchronous and asynchronous communication.

2.5.1 CMC applications and functions

December (1996:426) provided the following summary of what he regarded as "the possibilities for communication on the Net" together with a brief outline of the main categories of interpersonal communication provided by CMC systems:

Possibilities for Communication		
	Time Constraints	
Audience	**Synchronous**	**Asynchronous**
One-to-one	Talk	E-mail
One-to-many	Mbone	E-mail, moderated Listserv, World Wide Web, FTP, Gopher
Many-to-many	MU*, IRC	Usenet, Interactive Webbing

December (1996:426) explained his model as follows:

Talk: refers to real-time text interchange between two users

e-mail: allows a user to send a message to another user

mbone: live audio and video multicast virtual network using the Internet

Listserv: a mailing-list server for group communication

WWW: a system that allows for the accessing of resources through network-distributed hypertext

FTP: allows users to add/copy files on remote computers

Gopher: provides access to resources using a graph of menus

*MU**: family of systems for real-time text-based interchange amongst groups

[2] Internet relay chat (IRC) signifies harmonized text-based communication on various topics

IRC: refers to real-time, text-based discussion on a changing set of topics

Usenet: provides asynchronous text discussion on a fixed (but expandable) set of topics

Interactive Webbing: gives people common space for network-distributed multimedia writing

The most common and best-known form of asynchronous communication is e-mail. Through electronic mail, text-based messages are sent over communication channels. December further identified two asynchronous text-based CMC tools, namely Listserv and Usenet. Listserv allows online communication or access to information using e-mail. Usenet is another 'platform', which allows for asynchronous discussion about topics. One of the most significant aspects of these 'tools' is its fundamental power to bring people together in online communities of interest (December, 1996:27). It is noteworthy that asynchronous communication does not require real time communication but allows the user to communicate at a time that is regarded as more convenient to the user. December further elaborated and illustrated that asynchronous voice and/or video forms of communication were developed as extensions to e-mail software. For example, digitised voice and video files can be transmitted as attachments to e-mail and viewed or heard at any time convenient to the receiver. Furthermore, asynchronous applications such as USENET, newsgroups and electronic mailing list software provide additional means of communicating, at a time suitable to the individual, irrespective of whether the person is the receiver or sender of a particular message (December, 1996:425-427,435,441).

McHaney et al. (2000:65) and Herring (2002:128) noted that conferencing systems, which are in real time, allow one-to-one or direct human communication between individuals or even within a small group. Herring (2002:112) further indicated that in order for CMC to occur at the same time, different computers need to be linked in real-time, i.e. allowing for the communication (in real-time) between two people, by means of electronic media. The most common synchronous communication tools consist of text-based chat, video conferencing and low bandwidth voice communication.

2.5.2 Electronic journals

It is a well-known fact that the printed journal article has traditionally been the communication tool through which researchers communicated their findings. Developments in electronic technology changed this and the electronic journal became another possible mode of communication. Lancaster (1995:523) noted that an electronic journal is usually a journal made available for the 'electronic medium'. He stated that an academic journal in electronic format can provide more advantages than hard copy journals:

> "More rapid publishing of research results through submission of articles; network communication among authors, editors and referees; and contributions can be added to a database as accepted rather than held to form the next "issue". More efficient dissemination of information through the matching of articles newly accepted into databases with the interest profiles of potential readers. Innovative ways of presenting research results and other forms of data and information models, motion, sound, hypertext and hypermedia linkages (including linkages among journals and other electronic resources). Public peer review facilitated through the ability to link reader comments and evaluations to published articles. Lower cost per successful match between article and reader. Speed of publication and ease of communication leads to a more interactive journal in which one contribution may spawn rapid responses from other researchers" (Lancaster, 1995:523).

From the late 1990's onwards, researchers accepted electronic journals as a substitute to print journals (Tenopir et. al., 2003:online). Electronic publishing allows academics to explore a new outlet for scholarly publication, one in which they can bypass the present journal publishers and publish the results of their own research in electronic format. The downside of bypassing the formal publishing process is that the control mechanisms of the formal scholarly communication process, such as peer reviewing, is then also eliminated. Many publishers are therefore publishing journals in both print and electronic formats.

2.6 E-mail characteristics

It was reported by Leiner et al. (2001:6) and Moschovitis et. al. (1999:77) that the new communication medium, electronic mail, was first presented at the International Conference on Computer Communications (ICCC) in 1972. Ray Tomlinson, a computer expert at Bolt, Beranek and Newman, a company that was also involved in the designing and building of the ARPANET, designed two systems to facilitate the exchange of electronic messages among

ARPANET users. Moschovitis et. al. (1999:77) noted that Tomlinson introduced the @ sign, which has become the standard way of separating the user and the user's server in electronic mail addresses. This was a precursor of the kind of activities we see on the Internet today, and has resulted in the enormous growth of all kinds of computer-mediated communication, amongst others the use of e-mail.

Notess (1997:242) noted, "E-mail has been and remains one of the most highly used functions of the Internet". Electronic mail, or e-mail as it is generally known and referred to, is a specific form of computer mediated communication. Kerr and Hiltz (1982:2-3), Sproull and Kiesler (1986:1149) and Herring (2002:113-115) noted that computer technologies facilitated user to user communication by allowing messages to be sent, saved and edited, and even printed. Users of e-mail compose a message on a computer and forward it electronically to other computers, all linked to one another through a central server. It is obviously not only a matter of sending messages (i.e. letters) but also the transfer of information that takes place using e-mail. Users that are geographically removed from one another can now communicate at speeds that were unthinkable twenty years ago, and in ways that it are more cost efficient than a phone call, mail or even face-to-face meetings. Notess (1997:242) noted that e-mail, with its asynchronous nature, allows the user ample time to compose a message, which is usually read before it is sent. Communication can thus be more accurate than merely speaking over a telephone.

Of concern, however, is the fact that e-mail is 'faceless'. Although it is defined in terms of 'people-to-people-traffic', the medium removes the personal dimension from the process of communication to a certain extent. The nature of the medium is such that one is communicating with someone, somewhere, without the visible person-to-person relationship. Impersonal communication then tends to become more aggressive and assertive, which according to Hiltz & Turoff, in itself is not necessarily negative as far as academic debate and research is concerned (1978:27-28).

The advantages of e-mail were already eminent in the late 1970 by Hiltz & Turoff which stated, that the main advantage is its flexibility and variety of applications. It is asynchronous, it transcends geographical limitations, and the frequency of use (communication) can enhance academic endeavour. The capacity for research, for example, can be strengthened significantly if sensibly used. Another important advantage that Burton

(1994:100) pointed out was that there is usually no cost involved for academics as the costs are paid by their institutions. A significant advantage identified by Sproull & Kiesler (1986:1497) is that the 'professional hierarchy' has less of an influence and junior academics may feel less 'intimidated' and participate more readily in academic debate using e-mail.

Whitaker (1989:357-365) noted that some possible barriers to electronic mail use could be the lack of easy access to equipment; initial cost is perceived to be high; it is perceived to be less convenient than fax; old habits die hard; lack of understanding of e-mail as compared to the telephone and regular mail; and lack of time to overcome the initial learning curve required to use the system. Rapaport (1991:2) added that e-mail also does not have the same 'fluid structure of true conferencing systems'.

Despite the fact that there are limitations attached to this medium of communication, the advantages far outweigh the disadvantages (Rice, 1987:111).

2.7 Conclusion

The convergence of communication and computer technology (software and hardware) has resulted in an ideal tool for scholarly debate and academic work in general and it has created a unique tool for research.

Where chapter 2 focused on the e-mail as one of the first, 'hot' applications of CMC in general, chapter 3 will elaborate on the role of e-mail within the context of academic discourse. Needless to say, the potential of e-mail as an instrument for research is rapidly being recognised. The use of e-mail will not only have an influence on the means of communication (computer mediated), but could also affect the format of scholarly debate. The usefulness of e-mail depends on the status of technology; i.e. the stability of the technology used will obviously impact on the communication process. A server that is constantly 'down' will influence the use of the new technology, and the fruits of this unique tool will thus be lost for any institution that does not have access to a stable infrastructure.

CHAPTER 3

E-MAIL AND THE COMMUNICATION OF KNOWLEDGE

3.1 Introduction

The post-1994 political dispensation saw the return of South Africa to the international arena and therefore it cannot escape the influences of international trends. In this regard the concept of a 'global village' and the role of information technology (IT)[1], specifically computer mediated communication, are of importance. Current trends in information technology developments indicate that computer mediated communication systems can be expected to increase progressively and become more versatile, widespread and significant both for work and educational purposes.

Voorhees (2001:5) has stated that the influence of IT cannot be underestimated in as far as it has shaped societies, and contributed towards the formation of new relationships (economical, political, and institutional). An important development is the fact that "the pathways to learning no longer lead automatically to institutions of higher education".

Within the context of the commercialisation of information, higher education institutions are competing more than ever before in the history of South Africa. The role of communication technology in this regard is significant, especially the use of e-mail. It provides academics with immediate contact and feedback from other scholars in their research field. One can argue that the 'Cyberspace University'[2] can soon become a reality and higher education institutions need to restructure and reposition themselves in order to continue playing a role in the provision of information, i.e. enabling students (learners) to obtain a specific qualification. Apart from infrastructure, teaching and research continues to play a crucial role in establishing and enhancing the capacity of a particular institution. The ability of a particular organisation to render a high quality service will ultimately have an influence on its

[1] For this study information technology must be seen as an umbrella term which includes infrastructure, equipment, hardware, software; in other words all the tools which make electronic communication possible. CMC on the other hand is considered to be more the process and channels through which communication take place (Using a computer to talk to someone).

[2] Cyberspace University (some academics call it virtual universities) could be defined as a futuristic university. It is a consortium of universities marketing their courses via the Internet, where students will be able to obtain a degree by selecting their courses from various universities or academic institutions.

sustainability. In concrete economical terms, in order to attract fee-paying students, the institution needs to provide value for money. The quality of the 'Cyberspace University' is, to a certain extent, dependent on and related to its human resources component where research and scientific development is of significance. Research that leads to relevant insights play a crucial role in as far as a particular institution - through the research process - can stay on the threshold of scientific development and therefore be capable of delivering a particular service. Higher Education Institutions need to keep one step ahead of other competitors, especially with state of the art information technology development and equipment.

It therefore came as no surprise that as early as 1986 Hayes noted that tertiary institutions in the US were already depicted as places of communication excellence; after all "That's where the real revolution is occurring - communications and information" (Hayes, 1986:71). Generally speaking, research is about communication and sharing and creating information. In a certain sense of the word, research could be defined as a specific mode of communication. The communication of information, specifically in an academic environment, consists of various methods by means of which messages are transmitted (Smith, 1997:online). It is almost self-evident today that information technology plays a crucial role in research, and with the creation and communicating of information.

Understanding certain aspects of the 'communication process' may therefore shed some light on research as well as the role of e-mail in the research process. In this regard the social dimension of research is significant. Research is not only a matter of individual attempts to grasp reality; i.e. what Mouton and Marais (1985:7) identified as the ontological dimension of research. They (1985:7-8) further categorised the dimensions that can play a role in research as the sociological-; ontological-; teleological-; epistemological- and methodological dimensions.

The focus of this specific research project is on clarifying the role of CMC and particularly e-mail in the academic environment and can be regarded, amongst others, as belonging to the social dimension of research. After all, academics participate in some sort of dialogue with one another in the research process.

The means by which information is communicated plays an important role and exerts at least

some kind of influence on the research process. The channel of communication is the medium' through which messages are sent from sender to receiver, e.g. in the written mode information can be conveyed by means of a printed book (Paisley, 1980:122). The 'mode of communication' is the physical structure in which it is determined such as oral, hand-written, printed and electronic encoding (Paisley, 1980:122).

Channels of communication can either be personal or impersonal. Personal channels of communication refer to communication between individuals and can be the direct communication between two individuals, or indirect via third parties. Impersonal channels of communication refer to channels where the information is first recorded and then transferred by means of a different medium, including a medium such as e-mail (Smith, 2002:11).

Crane (1972:115-120), Van Brakel (1996:200-201), Ng (1998:243-246), and also Weedman (1993:online) distinguished between formal and informal communication. With reference to the communication process, one could describe this distinction in terms of the range of channels researchers can use to acquire information, i.e. formal channels such as published expression of communication, and informal channels, often also known as 'verbal' - a colloquial use of the term which indicates a preference for oral interpersonal modes of communication. Informal communication consists mostly of the transfer of knowledge by informal means, such as unstructured discussions and informal meetings etc. Informal situations often serve as an environment where ideas can be shared, and often triggers the creativity that eventually leads to academic insights after these ideas have been subject to further analysis and critical investigation.

Crane (1972:115-120), Weedman (1995:online), Ng (1998:243) and Osburn (1989:277-280) were of the opinion that formal communication is regarded as a more structured process, and the communication of research results usually occurs by means of scientific publications and formal discussions such as conferences. Printed journals have long been established as the standard means of scientific communication, i.e. reporting scientific arguments and creating a platform for the cross-examination of certain propositions.

One could argue that it is crucial for current researchers to keep in contact and enter into a critical dialogue with colleagues in order to create knowledge and that they utilise information technology, such as e-mail, to a lesser or larger extent. The context of research is

now defined globally, and to a certain extent, determines that researchers not only familiarise themselves with this new context, but also exploit the exciting possibilities therein. There is no doubt that the means of communication of knowledge and information, their acquisition and application are powerful instruments in research and economic development.

3.2 Scholarly communication

The sociological dimension of the scientific endeavour requires that the concept of 'scholarly community' be clarified (Mouton, 1985:8; Harrison & Stephen, 1995:593, Finholt, 2002:73). In this regard the definition of Faigley (1985:238) where he identified a scholarly community as a group of researchers or developers with a specific focus would be appropriate. They usually establish a 'discourse community' i.e. an interest group attached to a specific academic domain to discuss issues or solve problems. Whilst the identity, role and function etc of the 'scholarly community' as such are not the central focus point in this study, one aspect of importance is e-mail as a mode of scholarly communication. What is of significance in this context is Popper's reference to the dynamic process by which scientific knowledge is acquired and where according to him:-

> "A scientist, whether theorist or experimenter, puts forward statements, or systems of statements, and tests them step by step. In the field of empirical sciences, more particularly, he constructs hypotheses, or systems of theories, and tests them against experience by observation and experiment." (Popper, 1959:27).

Kuhn (1970:4) labelled this process as 'normal science', i.e. a process where "...the normal work of a scientist, presupposes an organised structure of assumptions, or a theory, or a research programme, needed by the community of scientists in order to discuss their work rationally". The point being made is that science does not approach a particular problem in a neutral fashion - certain definitive expectations are already at work, influencing the research process in one way or another. 'Normal science', in other words, could be described as the research process that is taking place within a specific paradigm (Mouton, 1985:146). Although Popper's statement regarding the nature of science can almost be regarded as a cliché (Kuhn, 1970:4), it nevertheless suggested, as reiterated by academics such as Garvey (1997:126), that scholarly communication is at the 'crux of the scientific endeavour'.

Scholarly communities might even be described as 'discourse communities' (Harrison & Stephen, 1995: 592 - 594).

Before electronic media emerged as an alternative channel of communication, academic discourse or scholarly discussion was based on the assumption that the members of the discourse orient themselves around the media most commonly used to express their ideas. At that stage printed media provided the channel through which scholarly debate usually took place (Borgman & Furner, 2002:51). Harrison & Stephen (1995:595) suggested that "Most scholarly communities are oriented particularly around refereed journals as channels for communication and the research article as a genre of communication. While scholars share information and debate issues at conferences and other face-to-face meetings, for most disciplines, the refereed journal is the primary "site" for communication" (Harrison & Stephen, 1995:595).

Harrison and Stephen (1995:580) and Borgman and Furner (2002:51) noted that new technologies are fast changing the way we think about life in general, even specific aspects of our 'own' world(s), and the way we work, i.e. communicate with one another in the workplace. The rapid growth in communication systems (information technologies) has had a significant impact on all aspects of human endeavour, not least that of scholarly communication.

3.3 Electronic modes of communication and research

Lancaster (1978:105) predicted the 'paperless society' twenty years ago. His vision of computers that would send, receive and store all kinds of communications has now become reality, although the paperless society has not materialised.

With reference to the international research environment, the following contributions were made regarding CMC. Cohen (1995) investigated "whether faculty who use computer mediated communication" (CMC) achieved greater scholarly productivity as measured by their publications. Brown (1999) contributed towards an exploratory study that focused on the role of computer mediated communication in the research process in the field of music. Carley and Wendt (1991) looked at various models of communication; type of information

communication and the role of social ties in the communication behaviour of an extended research group[3]. They found that the information needs and communication patterns of the computer analysts differed from scientists in other fields, e.g. zoology or agriculture. Generally speaking, one could assume that electronic mail would impact positively on scientific communication networks. Bridges and Clement (1997) did a survey at two universities in the United States namely, Brigham Young University (BYU) and University of Tennessee, to test their assumption that a higher number of staff within the Humanities Faculty used e-mail than indicated previously in the literature. Chu (1994:77) earlier administered an e-mail survey to academics at two universities in the USA, in order to determine whether a constructive rapport exist between e-mail use and variables such as area of expertise and experience with computers. He further established that a "negative correlation, however, existed between age and the use of e-mail. The majority of the faculty members (92%) included in his study used e-mail in scientific communication, and they preferred e-mail as a communication channel to other options e.g. telephone, fax. They also pointed out that improvements were needed should e-mail be used more extensively for scholarly purposes in the academia".

Walsh and Roselle directed their enquiry on the relevance and impact of computer networks for science, focusing, amongst others, on e-mail. According to them the term 'computer networks' refers to all aspects that relate to "electronic discourse (E-mail, E-bulletin boards, E-conferencing, E-journals, E-chat) along with accessing computer databases and transferring electronic files" (Walsh & Roselle, 1999:22).

Walsh and Bayma (1996:343) previously described electronic networks as a 'virtual college', where dialogue takes place by means of a computer-based network, i.e. computer mediated communication (CMC) 'via the Internet' and they indicated that CMC could be usefully applied to various research interactions, particularly distance collaboration.

3.3.1 Distance collaboration

Smith (2002:15) noted that many recent studies have found that a rising number of natural and applied scientists are in some way or another interacting with the escalating number of

[3] Extended research group refers to a large number of dispersed researchers working together in a coordinated fashion.

electronic communication media and networks. Information communication systems have become part of the modern way of interacting and in many ways this is affecting the communication of information among natural and applied scientists. Electronic communication modes are in many instances overlapping and replacing conventional communication methods.

Walsh and Roselle (1999: 24-28) noted that the advent of communication technology had an exponential influence on the growing network of scientists worldwide. Especially in the scientific disciplines, collaborations escalated and the effects seemed to be linked to the use of computer communication technology. CMC technologies have been shown to reduce the need for academics to be geographically close to one another (Cohen, 1995:online; Walsh et. al., 1999:online).

In 1991 Carley and Wendt (1991:online) asserted that scientific networks had assumed new structures and become what they referred to as "extended research groups (a large number of geographically dispersed researchers working together in a coordinated fashion)". Orlikowski and Yates (1994:550) described one of the earliest CMC collaboration networks where participants used electronic communication to keep one another informed about the developing phases of a computer language project called LISP. The developers of the language were located at various universities and companies throughout the United Sates and their interactions were accomplished almost primarily through electronic mail transmitted via the ARPANET network. It is evident that these groups depended heavily on CMC to coordinate their work activities.

3.3.2 World science

Smith (2002:16) and Walsh and Bayma (1996:348-349) noted that the use of e-mail with its particular characteristics resulted in an increase of collaboration across national boundaries and a greater 'internationalisation' of scientific research, particularly in disciplines such as chemistry, mathematics and physics, that are not environmentally specific. Smith (2002:16) contended that the lines between formal and informal communication has become nebulous and authors and their readers now have the opportunity to engage in interactive online dialogue. The use of electronic networks further also enhances an individuals' professional recognition as they are exposed to increased network contacts.

Walsh and Bayma (1996:348-349) claimed that research partnerships between scientists in geographically dispersed locations would be difficult, if not unattainable, without the use of e-mail, with its cost saving, its speed and its asynchronous characteristics. Continental boundaries that posed problems in the past to researchers have become obsolete in view of the rapid growth and development in technology. Geographic separation is no longer such a huge problem and in fact, geographic separation can now be regarded as an opportunity in as far as different worlds (and their respective insight and differences or experiences) can now interact and enrich one another. In other words, academics from totally different environments or backgrounds can now communicate with one another and such communication inevitably leads to mutual enrichment. One of the most crucial changes in the work environment of sciences has been the burgeoning of remote collaboration, especially international collaborations (Finholt, 2002:73). This has largely been due to the use of e-mail as it is particularly well suited to overcoming costs (that travel to interact imposes) and time differences (brought about by different time zones).

Walsh and Bayma (1996:348) have, however, also noted certain disadvantages that are related to e-mail use in the scientific community. Some respondents, in their studies, indicated that they experienced problems with sending e-mail files over different networks and some contacts do not have the necessary equipment to receive or are not attending to their e-mail. They further elaborated that as "e-mail becomes more institutionalized; those who are without access become more isolated than they were before". They argued that if certain colleagues in places, such as Morocco, can only be contacted using old technologies, researchers may choose only to work with colleagues who are reachable through e-mail. Walsh and Bayma (1996:348-349) and Smith (2002:16) were of the opinion that scientific dialogue may become less accessible to the general public as more use is made of electronic communication networks. These network linkages could result in an exclusive environment where access is granted only to the privileged members.

3.3.3 Restructuring of research partnerships

Academics such as Sudweeks and Rafaeli (1996:116) have suggested that CMC has facilitated a re-organisation of research groups, encouraging those who participate in scholarly debate to intersect social, organisational and even continental 'boundaries'. Van Alstyne and Brynjolfsson (1996:1479-1480) noted that changes in collaboration models

implied that collaboration was being determined more by content, i.e. 'substantive fit', rather than by territorial or 'personal linkages'. Generally speaking, this interaction puts a greater demand on the participants in terms of commitments (Sanderson, 1996:98).

The very boundaries of organisations are being redrawn in terms of collaboration of a kind that transcends traditional geographical limitations. Networks encourage virtual research groups that connect a number of scientists, each contributing his or her niche of expertise to the 'project'. Projects can take advantage of the networks to gain access to exactly the skills that are needed and researchers can take advantage of the networks to gain access to a wider spectrum of scientists (Sanderson, 1996:95-99, Sudweeks & Rafaeli, 1996:116-117).

While CMC may facilitate cross-disciplinary collaboration, Van Alstyne and Brynjolfsson (1996:1479-1480) cautioned that it can also lead to a 'balkanization' of science, with researchers using their limited communication time to interact only with those in their specific research domain (anywhere in the world). It may be the case that this 'balkanization' of scientific communities will lessen the 'cross-fertilization' of ideas from discipline to discipline.

Although e-mail does provide the means to extend an academic's potential network of collaborators and facilitates existing collaborations it is not seen as a complete substitute for face-to-face or telephone interaction. It is obvious that the effect of these new forms of organising research and their impact on scientific outcomes still requires elucidation.

3.4 E-mail use and productivity

Frequent use of CMC has been found to be a significant predictor of faculty productivity when measured by publications produced as an indication of research output. With reference to publications it has been claimed that CMC has contributed towards the increase of co-authorship and researchers who frequently utilised computer networks also tend to be the most productive (Cohen, 1995: Online; Van Alstyne and Brynjolfsson, 1996:1479-1480). The increase in scholarly communication and use of CMC has thus led to increased research output and enhanced productivity.

Van Alstyne and Brynjolfsson have shown how CMC plays a significant role with regard to the increase in scholarly communication during research projects and the effect thereof. They referred to the instance where an inconsistency was discovered in a mathematical theory (Fermol Theorom), and this triggered an electronic exchange of ideas among researchers working in this field of mathematics. After lengthy discussions by e-mail the problem was solved (Van Alstyne and Brynjolfsson, 1996:1479-1480).

A study conducted by Cohen (1995:online) reported that electronic mail has made it possible for researchers to work from their respective home-offices as they now can keep in contact with one without being at their work place, office or laboratories. The use of distribution lists, bulletin boards, e-mail etc allows the researchers to stay in contact with one another within what he referred to as a 'communication circle'.

Although scholars can now communicate with one another and ignore the geographical distances between them, the time barrier cannot be ignored and this obviously does exert some sort of influence on the communication circle. For example, physics experiments often run on three shifts at times, causing some differentiation with regard to the actual time of experimenting, but this is also applicable to research in general. When person A is busy in South Africa at 19:00, person B in Canada might still be sleeping. It is however argued that the nature of CMC contributes towards reducing the possible impact of time dispersion created by different time zones.

From the above it is clear that e-mail provides a convenient way for scholars to keep each other informed. CMC, in general provides a way for the integration of various work groups that may be both geographically and chronologically dispersed and allows for high-level contact among remote collaborators.

3.5 Conclusion

In this chapter it was argued that the development and impact of CMC is fast changing the way we work, i.e. communicate with one another in the workplace and the way we think about life in general. This is particularly true for the academic work environment. The rapid growth in ICT's (information communication technologies) has had a significant impact on

all aspects of human endeavour, not least that of scholarly communication. The role of information technology and understanding certain aspects of the communication process may therefore shed some light on research as well as the role of e-mail as a mode of scholarly communication in the academic environment.

Despite the aforementioned role and impact of CMC within the international research and academic environment, very little research was found in the literature on the impact of CMC on academic work at South African universities (see also Chapter 1).

CHAPTER 4

CONTEXT AND LANDSCAPE OF THE UNIVERSITY OF FORT HARE AND UNIVERSITY OF PORT ELIZABETH

4.1 Introduction

As indicated in Chapter 1 the intention of the study is to focus on the place, role and function of e-mail as part of computer mediated communication at the University of Fort Hare and the University of Port Elizabeth. In this section, a very brief description of the context and landscape of the two study environments, the UPE and the UFH will be outlined and compared, in order to provide the general background for this study. In view of South Africa's past political system, which led to the establishment of different academic institutions for the different population groups, as well as the impact of this ideologically-biased guiding principle on the functioning of these institutions, further clarification is needed.

For many years, the two worlds of South Africa, i.e. the 'first' and the 'third world' were largely separated. The distinction between these two worlds is also specifically reflected in tertiary education in South Africa where the Historically Disadvantaged Institutions (HDIs) served predominantly the historically disadvantaged black communities while Historically Advantaged Institutions (HAIs) served the white communities (South Africa, 2001:6). The historical reality of the political situation has shaped and nurtured the present situation in South Africa. In fact, it influenced every aspect of life of the people of South Africa, and its effect will continue to impact South African society, for many years to come.

On the African continent South Africa is the one country (generally speaking) that has the capacity and human resources to develop and improve Information Technology (IT). As such, it incorporates and enhances the 'first world' component of society, and the danger is that this aspect will serve to improve only a certain sector of society, excluding a large number of impoverished people from disadvantaged communities.

This is evident, to a certain extent, in the national tertiary landscape and financial and service institutional infrastructures, all of which make use to a lesser or larger extent of computer based communication. Goodman (1996:207)[1] cautioned in 1994 already that the information IT infrastructure in South Africa is limited and only a third of its population have the luxury of IT facilities, indicating that South Africa is still in many ways a developing country where certain political, geographical and regional constraints play a role in the development of infrastructure. The development, distribution and use of IT infrastructure are not isolated from the socio-political problems unique to South Africa.

If these problems are not addressed soon, the disparity between the so-called HAIs and HDIs will remain. The general contexts in which the institutions find themselves have a significant impact on the general functioning of the various institutions.

4.2 Establishment of the two universities

The mere designation of the two institutions as historically advantaged or disadvantaged warrants a brief historical comparison of the two institutions.

As early as 1878, the need for an educational institution for the Xhosa speaking black people of the Eastern Cape was raised (University of Fort Hare, 1970:3). In 1914, a constitution for a College at Alice was adopted and a Governing Body established. The South African Native College opened officially on 8 February 1916. Four months after the opening, Council agreed to accept Indian and Coloured students.

However, during 1959-1960 the National Party Government transformed the college into an ethnic college for Xhosa-speakers only and reduced it to the level of a 'Bush College' (University of Fort Hare, 2001b:22). In 1970 Fort Hare became self-governing and 'independent'. This independence must be seen against the background of the 'homeland system' (University of Fort Hare, 1970:15). Although the University was then opened to all population groups with regard to the student body, it still consisted of predominantly of Xhosa speakers. The emerging political

[1] The article was reprinted with permission from Communication to the ACM in February, 1994 21-25

developments in South Africa however, also had a guiding influence on the UFH and eventually this led to the appointment of the first black Vice – Chancellor, who served from 1990-1995 (University of Fort Hare, 2001b:22).

During the 1990s the University of Fort Hare suffered a critical administrative and financial collapse. Prof Saunders was assigned by the Minister of Education to investigate the "affairs of the University of Fort Hare in terms of chapter 6 of the Higher Education Act" (No.101 of 1997). Some of the reasons for the collapse, according to the Saunders report, were that "Fort Hare had a current student debt of 17 million at the beginning of 1999. There is general agreement that, while that is an important part of the problem, it is not the only problem and its resolution will not solve the university's financial problems by itself" (South Africa, 1999a:online).

The University endeavoured to carry out a comprehensive review and restructuring of Fort Hare University to address many of its financial, organisational and managerial problems. The more recent processes can be seen as an attempt to reposition the University in relation to current educational and social realities, in which the Government Policy concerning tertiary education plays an important role (University of Fort Hare, 2000a:1-8).

The history of the University of Port Elizabeth (UPE) too cannot be seen in isolation from the political/ideological climate that shaped the tertiary educational sector, also as far as the location of the various universities is concerned. The establishment of a dual medium (English and Afrikaans) University for the 'white' population group, a first for South Africa, was contemplated as early as 1965. The establishment of the University of Port Elizabeth resulted in the withdrawal of Rhodes University from Port Elizabeth and this curtailed its further expansion while it assisted in the growth of UPE (Rautenbach, 1995:xvii-xviii).

In 1974 the University had grown to such an extent that the campus was relocated from the Bird Street campus to the newly established modern 'campus by the sea' (University of Port Elizabeth, 2001a:21).

4.3 Geographical location of the two universities

The University of Fort Hare (UFH) is situated on the historic site of a former British military stronghold. This military outpost was named after a British officer and is located in the vicinity of Alice, approximately 220 km north east of Port Elizabeth, with King Williamstown (70 km) and East London (120 km) to the east, and Fort Beaufort 20 km to the west of Alice. Although road and rail connections exist between these various places, it cannot be ignored that Fort Hare is situated in a remote rural environment, somewhat removed from its immediate constituency (University of Fort Hare, 2000b:4).

The University of Port Elizabeth is situated in the City of Port Elizabeth. Port Elizabeth has a population of approximately one million inhabitants and is located on the Indian Ocean about halfway between Durban and Cape Town. As one of the 'bigger cities' in South Africa, Port Elizabeth has a well established infrastructure and is one of South Africa's main harbour cities. The majority of students are from the newly named Nelson Mandela Metropolis. As stated in the University of Port Elizabeth Calendar, "The situation of UPE's campus by the sea, its privileged position in being able, as a result of smaller numbers, to give more individual attention to students and its unique dual- and parallel-medium character are making UPE specially sought after as an institution of higher education" (University of Port Elizabeth, 2001a:21).

4.4 Organisational structures

The University of Fort Hare embarked on another strategic plan in 2000, as did all South African universities, in response to the newly identified governmental mandate to implement changes within the tertiary educational sector. The Strategic Plan 2000 was implemented to provide an organisational structure in line with the so-called 'Size and Shape Document' document and the White Paper - "A Programme for Higher Education Transformation". The UFH strategic plan focused on the reshuffling of departments and faculties, resulting in the various departments at Fort Hare to be relocated within four newly established faculties instead of the original eight faculties, while executive Deans were appointed to head the respective faculties. The strategic planning document proposed the following faculties:

Faculty of African and Democracy Studies:

Law Cluster (previously the Law Faculty).

Theology Cluster (previously the Faculty of Theology).

Arts Cluster (previously the Humanities Faculty).

Faculty of Management Development and Commerce:

Cluster of Economic Sciences (previously the Faculty of Economic Sciences).

Social Sciences Cluster (previously the Faculty of Social Sciences).

Education Cluster (previously the Faculty of Education).

Faculty of Agricultural and Environmental Sciences:

Agriculture Departments, Geography and Environmental Science (previously the Faculty of Agriculture).

Faculty of Science and Technology:

Natural Sciences (including the Nursing science departments).

In addition to the newly established faculties, there are also a number of Centres, Institutes and Administrative sections, which make up the University of Fort Hare. These organizational developments necessarily influence the various functions of the academic sector, including the research process. The UPE likewise responded to the abovementioned 'White Paper'. The following was recommended, "In recognition of the University's Mission and Strategic Direction statement, the financial feasibility and strategic arrangement of Departments and Units was closely examined by line management groups which resulted in the following structural changes" (University of Port Elizabeth, 1999b:22):

Faculty of Arts:

School of Languages (previously Faculty of Arts)

School of Music (previously Faculty of Arts)

School of Social Sciences and Humanities (previously Faculty of Arts)

Faculty of Economic and Building Sciences (previously Faculty of Economic Sciences)
Faculty of Education (previously Faculty of Education)
Faculty of Health Science (previously Faculty of Arts and Department of Pharmacy)
Faculty of Sciences (previously Faculty of Science)
Faculty of Law (previously Faculty of Law)

Apart from the above-mentioned faculties, a number of supporting academic structures exist (Bureau/Centres/Institutes/Clinics/Units/Schools). Non-Lecturing Staff (Managerial/Academic administration, Library services etc) align themselves to the core function of the University (University of Port Elizabeth, 2001a:27-36).

4.5 Students

The majority of students at Fort Hare are from the former Ciskei, an impoverished area of South Africa that is now incorporated in the newly structured Eastern Cape Province. These students did not receive the same quality of schooling as did their white counterparts, and many of them are consequently ill-prepared for tertiary education. The managerial and organisational problems at Fort Hare are to a certain extent reflected in the student enrolment patterns.

In 1995 Fort Hare had approximately 5208 students, but by 1999 the enrolment had dropped to 2869. From 2000 to 2002, however, the student numbers increased gradually from 3961 to 7190 (University of Fort Hare, 2002a:online). See also 4.2. Establishment of the two universities).

According to the University of Fort Hare Strategic Plan (2000b:11), the reasons for the declining student intake in 1999 were various. Among the causes were 'internal deficiencies' such as poor marketing and faulty recruitment programmes. The decline in student numbers of 1999 in turn had a detrimental impact on the finances the University received as through Government subsidies are, largely based on student numbers. The Strategic Plan committee at the time thus recommended a combination of 'strategic downsizing' of staff with an 'upsizing' of student enrolments.

The dual medium University of Port Elizabeth started out with approximately 320 students that were registered for the first academic year, in 1965. The new University developed gradually, registering its 1000th student in 1970 (University of Port Elizabeth, 2001a:21). The student intake grew steadily to 6101 in 1999 and 8137 by 2002 (University of Port Elizabeth, 1999:8; 2002a:Appendix 2).

The UPE now has a well-developed infrastructure and has maintained a steady growth, as is evident by the student enrolment patterns. Currently the majority (77%) of the UPE students are from the Eastern Cape region of the former Cape Province (University of Port Elizabeth, 2003). This excludes the former Ciskei and Transkei regions. It is generally known that strong competition exists among tertiary institutions in the Eastern Cape to attract students.

4.6 Information Technology Service (ITS)

The University of Fort Hare's Review Report (2000a:183-185) identified a number of weaknesses regarding its computer and information technology services. The most crucial aspect was the lack of an Information Technology manager and the absence of a clear IT policy document resulting in an "inefficient decentralisation of IT management". IT planning was done without consideration of the entire University, and there was a significant disparity in the distribution and allocation of IT resources among the various academic sectors. Moreover, existing staff levels in the Computer Centre[2] were not adequate to meet the support requirements, nor were the network support personnel adequately trained to support the network. It now appears that subsequent to this report most of these problem areas have been addressed.

At the UPE the information technology facilities are well developed, for example, almost 75 % of the academics have access to a personal computer (PC). In a personal interview with the IT manager at UPE it became evident that the IT structures and the support provided by the UPE IT section were stable and supportive. At the time of the interview (1999) the UPE had a well-developed and clear-cut computer user policy, including a well-defined section on e-mail use (Nel, 2001).

[2] Information Technology Support (ITS) term was used in this study.

4.7 Library facilities

The National Commission on Higher Education (NCHE) that was established in 1995 had to re-assess the Higher Education scenario that was then in place and put forward suggestions for a new system of Higher Education. It comprised of five Task Groups including the Working Group on Libraries and Information Technology.

The Working Group on Libraries and Information Technology reported in 1996 that a typical HAI had well-equipped libraries with an average book stock of 507 000 titles, 7000 journal titles, and 200 Cd-Roms. HDIs usually had an ill-resourced libraries with an average book stock of 154 000 titles, 2700 journal titles and 44 Cd-Roms (South Africa, 1996:online).

The University of Fort Hare Review Report identified the following specific weaknesses of the University of Fort Hare library (UFHL). "A poor library collection - the collection is small, no new books have been acquired for the past 4 years, and the library does not subscribe to any newspapers at the moment." (University of Fort Hare, 2000a:175).

In 1999 the UFH library had approximately 140 000 books in its collection and 845 journal titles. In the year 2000 the UFH library services experienced another severe financial cut and the journal subscription was cut down to 630 periodical titles (University of Fort Hare, 2003b). However, towards the end of 2001 the situation improved slightly and the EBSCO electronic, database and full text journals sponsored by the Department of Education/European Union initiative, were introduced.

A brief comparison of the library collections at the two institutions in question reveals glaring disparities. In the year 2000 the UPE Library (Albertus Delport Library) had a book collection of 406 628 titles and 1133 current periodical titles and various electronic online databases such as EBSCO (University of Port Elizabeth, 2000:23).

4.8 Research output

According to a report by Bonthuys (2000:8-9), the ten HDIs produced less than 10% of the total higher institution research output. In Table 4.8.1. below the research output of both institutions is reflected, for the years 1999 to 2002. These dates were selected as they cover the year before, during and after the survey was conducted (1999-2002). As such, it illustrates a significant difference between the two institutions, specifically as far as research output is concerned, and in view of the number of staff at the two institutions respectively (the student /staff ratio relationship).

University of Fort Hare

From Table 4.8.1 below it was clear that in 1999 the academic staff: student ratio was 1:14. In 2000 the ratio was 1:15 and by 2002 it was 1:27. It was clear that if the staff/student ratios were compared between the two universities, the UFH reflects a far more favourable situation.

Table 4.8.1 [3]University of Fort Hare

Year	[4]Staff	[5]Students	[6]Publications (refereed journals)	Staff/ Student Ratio	Staff Publication average
[7]2002	259	7190	25	1:27	0.09
2001	267	5362	29	1:20	0.03
2000	270	3961	36	1:15	0.13
1999	300	4115	32	1:14	0.10

[3] All figures for UFH for staff and students were obtained from the ITS system from the office of HEMIS (1999-2002). (See UNIVERSITY OF FORT HARE, 2002a. Office of Higher Education Management and Information Systems (HEMIS). Alice: University of Fort Hare. [online].
[4] Staff figures are for the total permanent academic staff for both institutions.
[5] Student numbers exclude distance education students and are the contact headcount for both institutions
[6]UNIVERSITY OF FORT HARE, 2002b. Research report:1996-2000. compiled by Govan Mbeki research and development centre.Alice: University of Fort Hare.
[7]UNIVERSITY OF FORT HARE, 2003b. Sapse claim (not audited). Compiled by Govan Mbeki research and development centre. Alice: University of Fort Hare.

University of Port Elizabeth

From Table 4.8.2 below it was clear that at UPE the staff student ratio increased from 1 staff member to 27 students in 1999 to 1:33 in 2002. Publications output were almost similar for 2000 and 1999, however in 2001 and 2002 the publications rate dropped considerably. This could be attributed to several reasons such as the restructuring process of teaching programmes according to Mr D Fokker, University Librarian at UPE (Fokker, 2004).

Table 4.8.2 [8]University of Port Elizabeth

Year	Staff	Students	[9]Publications (refereed journals)	Staff/Student Ratio	Staff publication average
2002	243	8137	35	1:33	0.004
2001	242	7663	27	1:31	0.11
2000	242	7144	125	1:25	0.50
1999	241	6101	113	1:27	0.56

The year 1999 is noteworthy in as far as the situation at Fort Hare reflects a significant drop in student numbers, whereas the situation at UPE remained basically the same as far as the staff: student ratio is concerned.

It was further clear that there was a significant difference between the two institutions as far as research output, measured in terms of publications in refereed journals was concerned. If one compares Table 4.8.1 with Table 4.8.2 for the years 1999 and 2000 the research output at UPE was, generally speaking, almost threefold more than that of the UFH. This was despite a higher staff student ratio at UPE. This study did not intend to establish what the causal relationship for the disparity in research output was. It can be summarised that the low publication rate for UFH could possibly be attributed to the poor library collection, IT infrastructure and financial constrains in general but this needs to be verified.

[8] All figures for staff and students were obtained from the University of Port Elizabeth, Annual General Reports for 1999, 2000, 2001 and 2002.
[9] The reporting structure for journal publication output for UPE differ from all previous years and makes comparison for 2001-2002 difficult (See University of Port Elizabeth, Annual report 2001b/2002a).

4.9 Financial comparison

The lack of financial stability and viability at UFH has been identified as a key problem that has impacted negatively on all aspects of the institution. The existing revenue base for the UFH derives from essentially three sources, i.e. state subsidy, fees collected from students, and donations and grants from external sources. A large proportion of the total running costs (80%) are covered by the subsidy received from the state. This source of funding has been shrinking for a number of reasons. The drop in student numbers, a principal basis for determining subsidies, since 1995 has resulted in loss of income from this specific source of funding. Concurrent with these financial pressures at UFH was a lack of proper administrative and managerial systems to ensure that good financial control would allow the University to adapt to changing revenues. Governance at Fort Hare often remained deficient during certain periods and to such an extent that it warranted a thorough investigation by the former minister of education (University of Fort Hare, 2000b:13).

The government subsidies for the two institutions were comparable for 1998-2000 despite the difference in student enrolment for those years. The government subsidy to the University of Fort Hare was 89 million Rand for 1998/1999 and 101 million rand for 1999/2000 (South Africa, 1999:online). The UPE received 86 million Rand in financial allocations from the government in 1998/1999 and 112 million in 1999/2000. (South Africa, 1999:online). Lack of financial stability and managerial problems at Fort Hare are also acknowledged at present and recent developments regarding the restructuring of tertiary institutions in South Africa could be seen as an attempt to address at least some of these difficulties experienced by Fort Hare. The UPE has not experienced financial problems to the extent that UFH has. The administrative and managerial systems at the UPE remained intact; a steady increase in student numbers over the last couple of years also contributed to continued stability.

The financial and more stable situation at UPE was confirmed by the National Working Group (NWG) appointed by the minister to recommend proper action for the reforming of higher education. The NWG recommended that the financial and enrolment stability which the University of Port Elizabeth enjoys should not change (South Africa, 2002:online).

4.10 Conclusion

As mentioned earlier, historical developments in South Africa influenced the tertiary sector in a very particular way. This brief overview of the two institutions serves to illustrate and clarify the working environment at the two institutions as to location, staff, student ratios and research output. Despite some similarities such as staff contingent, there are significant differences, such as location. The drop in student numbers at Fort Hare, as reflected for 1999, was quite significant and must be seen against the backdrop of the administrative collapse that Fort Hare experienced. The research output could be indicative of and related to the working environment as such. In this study, however, this overview serves merely to provide the environmental context for the empirical study and to contribute towards the conceptualisation of the work environment at an HAI as opposed to that of an HDI.

CHAPTER 5

METHODOLOGY

5.1 Introduction

This chapter outlines the research methodology and research design that the researcher decided to apply for this study. The purpose of this chapter is two-fold. Firstly, attention will be given to the research strategy and procedures that were followed and in the second place it will focus on the methodological presuppositions; i.e. elaborate on the methodological presuppositions that influenced the approach that was followed in this investigation. Mouton (1996:125) referred to this aspect as 'operationalisation', i.e. the development of certain measuring instruments that enable the researcher to acquire accurate data about a specific phenomenon under investigation. In this instance the study attempts to collect data that would shed more light on, and enable one to understand e-mail as an important application of computer mediated communication (CMC) by academics and to compare the status and role of CMC at a Historical Disadvantaged Institution with that of a Historically Advantaged Institution.

5.2 Aim of the research and identification of research questions

As indicated in Chapter 1, the use of CMC and particularly e-mail has become an important and integral component of the academic work environment. It contributes towards and facilitates research and communication not only within a specific institution but also among all participants in the wider scientific and academic community. The question, however, raised in Chapter 1 was whether academics in the Eastern Cape, one of the least developed provinces in South Africa, are utilising CMC to its full capacity in their academic work. The researcher was further motivated to investigate the difference between CMC use at a HDI and a HAI to see if inherent backlogs within HDI's impacted negatively on CMC use. Using the Eastern Cape as a study region the researcher thus decided to investigate CMC use at the UPE, an HAI and the UFH, an HDI. The study also took into consideration other factors that emerged from the literature survey that could potentially impact on CMC use.

Thus the main thrust of the study was to establish whether the adoption of CMC has had a significant effect on the academic activities at the two institutions, and to establish whether there are any significant differences between the two institutions in their application of CMC. To achieve this, the study focused on various interrelated aspects regarding CMC. Firstly, what was the status, capacity and support for CMC at the two institutions and secondly the use of CMC by the academics. This latter aspect was related to the CMC competence of the academic staff (technical knowledge of e-mail), familiarity with the various applications and whether they actually made use of CMC in their work environment. In addition to this, the study finally focused on the effectiveness of e-mail use and the effect of CMC on academic endeavour in general.

To achieve these objectives the study was guided by the following research questions:

1. What is the perceived status of CMC at the two institutions ?
2. What is the competency level of academic staff with specific reference to utilising CMC applications in their specific environment ?
3. To what extent and for what purposes do academics use CMC, specifically e-mail, in their academic work environment ?
4. Are there any differences between the two institutions with regard to CMC use ?

5.3 Research design and methodology

Research is the process of collecting and analysing information in order to increase our understanding of the phenomenon under investigation. Leedy & Ormrod (2001:4-5) listed the following characteristics of the research process:

"1. Research originates with a question or problem.
2. Research requires a clear articulation of a goal.
3. Research follows a specific plan of procedure.
4. Research usually divides the principal problem into more manageable subproblems.
5. Research is guided by the specific research problem, question or hypothesis.
6. Research accepts certain critical assumptions.
7. Research requires the collection and interpretation of data in an attempt to resolve the problem that initiated the research.
8. Research is, by its nature, cyclical or, more exactly, helical."

The abovementioned guidelines could be regarded as general characteristics of the research process. By its nature/ designation, these could differ from one research project to another. This nevertheless highlights the need for researchers to manage their research in an academically respectable manner, i.e. to plan their overall research design and elaborate on the specific research methods in a purposeful way so that they can acquire and interpret the data relevant to their research problem.

From the above it is clear that a researcher should follow a research plan for the accumulation and interpretation of data to solve the research problem(s). Such a plan or research design consists of an array of rules that enable the investigator to conceptualise and observe the problem under study. In so doing, the researcher must firstly demarcate and clarify the exact purpose of the problem under investigation as well as the best way to solve it. In addition to this, the way in which the research project will be implemented in order to maximise findings to answer the research questions should be established (Adams & Schvaneveldt, 1991:105; Mouton, 2001:56).

Mouton and Marais (1985:16) viewed research methodology as the broader approach or strategy that a researcher uses in developing a research project. This includes the choice of methods and techniques as well as the underlying principles and motivation for using certain methods and techniques. Recognition of the limitations and the influence of methodological preference on the type of data analysis employed, contributes towards an academically respectable interpretation of the findings. Bailey (1982:32) noted that research methodology includes "assumptions and values that serve as the rationale for research and the standards or criteria the researcher uses for interpreting data and reaching conclusions". The most appropriate research methodology for a study should be determined by the overall purpose of the study. The research purposes that generally apply are those that aim to explore a situation, or describe a situation or explain a situation, or a combination of these approaches. This study follows a descriptive as well as explanatory [1]approach, as these two aspects are not mutually exclusive.

[1] These aspects will be elaborated and clarified later in this chapter.

5.4 Survey research strategy

Denscombe (1998:7) cautioned that the "survey approach is a research strategy, not a research method". Many methods can be incorporated in the use of a social survey. Generally speaking the word 'survey' is derived from the Latin words '*super*' and '*vider*' and therefore has the basic meaning of looking over and beyond, i.e. in its broadest sense it would mean observation (Leedy, 1974:79).

Surveys usually entail more than just a general or vague perception of a particular phenomenon. Rather, the observation, and accompanied description thereof is authenticated through a process of data collection, formulation of hypothesis or research questions and the testing (verification) of a particular hypothesis or research question. According to Polland (1998:online), surveys are a methodical technique requesting persons to voluntarily assist in sharing information about their thoughts, beliefs and viewpoints. By means of a survey the phenomena are observed in a scientific and rational manner, i.e. there is an element of control and objectivity that is inherent to the process. Leedy & Ormrod (2001:196) have stated that after collecting the data, the researcher(s) will be able to summarise their (respondents) viewpoints with percentages or aggregates, and also describe conclusions about the phenomena based upon a "particular population from the responses of the sample".

The success of survey research is related to the extent that the information provided and observed relates to that aspect of reality that the researcher wishes to investigate. A researcher can make assumptions about a larger group of elements by studying a reasonably small number representative of the larger group (Powell, 1991:53). The importance of survey research techniques in the research process is, amongst others, that it can save time and money without sacrificing efficiency, accuracy and information adequacy (Busha & Harter, 1980:54).

The following can be identified as advantages and disadvantages of surveys. Surveys provide the investigator with a research tool that enables the researcher to collect relevant data. This data in turn, is essential for a detailed description or interpretation of populations or other phenomena under investigation. Surveys allow one to describe heterogeneous populations accurately and economically. Compared to alternative research methods, surveys cover a

broader spectrum of research areas. It has the potential to generalise to large populations if an appropriate sampling design has been implemented and it assures high measurement reliability if a proper questionnaire was developed. The extent of data collected in the survey, further, may yield unexpected findings or may even lead to new hypotheses altogether (Singleton et al., 1988:239-240). The major disadvantage of surveys relates to the possibility of a high non-response rate from respondents, sampling errors and questionnaire inaccuracies.

The researcher views the survey research technique as the most suitable to adopt for this study and thus decided to utilise this method to investigate the adoption and use of CMC. The survey further attempted to establish whether the adoption of CMC has had a significant effect on the academic activities at the two institutions studied, and whether there are any significant differences between the two institutions with reference to the application of CMC by their academics.

Rubin and Babbie (1997:346) indicated that survey research can belong to one or a combination of the major research designs, viz.: exploratory, descriptive and explanatory. Exploratory studies are about viewing and measuring phenomena in a particular way, striving towards a more informed understanding of a particular aspect under investigation (Adams & Schvaneveldt, 1991:103). Descriptive studies give an explanation of the characteristics of some population or phenomenon being studied and provide ample means for its measurement. They cover a wide range that can vary from in-depth description of particular units of analysis to an indication of the frequency with which a specific characteristic occurs in a sample (Smith, 2001:2). The goal of explanatory studies is to determine and assess the associations between different characteristics of the phenomena being studied, such as the possible fundamental relationship between variables and events. The initial assumption is, of course, that a relationship of some kind exists between variables with usually a specific sequence of cause and effect. The purpose is to authenticate and explain (test) this connection (Smith, 2001:4).

The approach followed in this investigation includes both descriptive and exploratory elements, and certain characteristics of comparative studies. This investigation attempts to provide an initial and preliminary understanding of e-mail use by academics at the University of Fort Hare and University of Port Elizabeth. The responses obtained from the academics at

the two institutions will be compared to establish whether there are any variances between the two institutions' use of CMC. Research results reported in the literature of other similar studies further prompted the researcher to investigate the effect, if any, of independent variables such as age, position, gender and number of working years. This study is based on a holistic research design which incorporates qualitative and quantitative, descriptive and comparative elements rather than on a rigorous positivist design. For this reason the research process is guided by appropriate research questions rather than a formalised hypothesis (Powell, 1997:37).

5.5 Time dimension

The researcher has to choose a specific time dimension that is appropriate to his/her research. Leedy and Ormrod (2001:194) identified the following two time-dimension designs, namely cross-sectional and longitudinal studies. The former occurs when the study is restricted to a short period (cross sectional design) and the latter when phenomena are studied over a period (longitudinal designs). Thus, observations and descriptions can be related to a specific period, or they may be deliberately stretched over a long period of time.

It was decided that the cross-sectional survey design was the most suitable method to apply to investigate academics' use of CMC at the two respective universities.

5.6 Units of analysis and survey population

The objects under investigation can be defined as the 'units of analysis. Units of analysis usually contain people, social roles, positions and relationships (Singleton, 1988:69). Data related to the phenomenon under investigation are collected for the purpose of describing the individual unit of analysis, and those descriptions are regarded as representative of the target group and enable one to describe the observed phenomenon in more detail (Babbie, 1973:60). Individuals, for instance, could be described by status such as age, gender or orientations such as opinion, preferences and so on. The three main categories of units of analysis most commonly employed in social research are individuals, groups (which includes formal social organisations and institutions) and social artefacts.

The units of analysis for this study were the academics selected for the study from the University of Fort Hare and the University of Port Elizabeth respectively. These academics were investigated and will be described on the basis of the institutions that they belong to, their specific age, gender, position and number of working years. Through this process a profile of the academic staff at the two institutions should emerge in relation to their CMC (specifically e-mail) use.

A population could be defined as the aggregate of all cases or units of analysis being studied. Busha and Harter (1980:66-67) defined a population as any "set of persons or objects that possesses at least one common characteristic". The population of study would be the total academic population of the two universities (UPE and UFH).

5.7 Sampling

Sampling can be described as the method of identifying certain units of analysis out of a larger whole (Rubin & Babbie, 1997:233). If correct sampling procedures are used, one can infer characteristics of the whole from data collected from the sample. It is a method generally used in social sciences (and thus LIS) research where one works with large populations and by sampling one can analyse fewer cases far more intensely and economically.

The researcher who has fewer cases to study furthermore has greater control over the field of investigation, and generally will obtain a greater response rate and better co-operation from the respondents. Further practical advantages of using sampling methods include a saving of time, labour and cost. When designing the sampling process care should, however, be taken to ensure that the sample selected was unbiased to ensure external and internal validity (Smith: 2001:2).

For a number of reasons, such as practical, logistical problems and geographical scattering as well as financial constraints, it was not possible to include the entire academic sector of the two institutions in question. By using sampling techniques, an attempt was made to select a representative proportion of the population being studied.

5.7.1 Sampling design

In order for a researcher to study a population, he/she has to identify different sampling designs that may be appropriate in different situations. Two major sampling designs can be identified, namely non-probability and probability sampling. The difference between non-probability and probability sampling is that non-probability sampling does not involve random selection but probability sampling does (Leedy & Ormrod, 2001:211).

5.7.1.1 Non-probability sampling

Leedy & Ormrod (2001:218) noted that in non-probability sampling, the sample is selected in such a manner that the chance of being selected of each unit within the population is unknown. The choice of the subjects is subjective, since the researcher relies on his/her experience and judgement. Powell (1997:68) noted that non-probability samples "suffer from important weaknesses". As a result, there are no statistical techniques that allow for the measurement of sampling error and therefore it is not appropriate to project the sample characteristic to the population. Almost all qualitative research methods rely on non-probability sampling techniques.

5.7.1.2 Probability sampling

Unlike non-probability sampling, probability sampling requires the investigator to select a set of elements from a population in such a way that inferences drawn from these elements can be extended accurately to the entire population.

5.7.1.2.1 Stratified random sampling

Stratified random sampling is a method for obtaining a greater degree of representation and decreasing the probable sampling error. The ultimate function of stratification is to organize the population into homogenous subsets and to select the appropriate number of elements from each. (Babbie & Mouton, 1998:191; Denscombe, 1998:12-13, Leedy & Ormrod: 2001:211).

For this study the researcher applied stratified random sampling because it provides a method to obtain a greater degree of representation and thus decreases the probable sampling error.

Stratified sampling is based on the basic principle of ensuring that appropriate numbers of elements are drawn from homogeneous subsets of the population, in this case full-time employed academics working at the University of Fort Hare and the University of Port Elizabeth. The basic assumption is that the sample should reflect the characteristics of the 'parent population' (Smith, 2001:5). The choice of stratification variables depends on what variables are being measured. Stratified sampling ensures the proper representation of the stratification variable to enhance representation of other variables related to them. For the purpose of this research project the researcher thus decided to stratify in such a manner that adequate representation of the two academic sectors (UFH and UPE) were achieved.

5.7.2 Sampling unit

Sampling units are the elements in the population that the researcher decides to select for the investigation. All sampling units constitute the sample in its collective sense (Smith, 2001:2). In the case of this study the sampling units are the academics that were selected from various departments at the two respective universities.

5.7.3 Sample frame

A sampling frame is the list of elements from which the researcher can make his or her selection for the study population (Babbie & Mouton, 1998:174; Denscombe, 1998:17). In single stage sampling designs the sampling frame is simply a list of the study population. The sampling frame should correspond to the list of elements that collectively constitute the population under investigation. To be able to draw inferences relating directly to the population, the sampling frame and list of elements in the population should be identical (Smith, 2001:2).

In this study academics were selected from faculty lists and these lists thus constituted the sampling frame. The researcher ensured that all elements of the population were included in the sampling frame to avoid potentially biased sample being drawn and all foreign elements were ignored such as faculties and departments that were not represented equally in each institution. At the time of distribution of questionnaires, the UFH (because of a strategic planning and restructuring process) had less professors than the UPE and a decision was made to secure six respondents from each Faculty at each institution at professorial level

(including full and associate professors) to ensure equitable representation of this stratum in the sample.

Academics were chosen from the faculties of Arts, Sciences, Humanities, Education, Economic Sciences and Law. It should, however, be noted that the faculty structure at the UFH differs from that of the UPE. The researcher made a decision to follow the UPE faculty structure for consistency and unity. In view of the fact that agriculture (UFH) and architecture (UPE) were only offered at the individual institutions respectively, they were not included in the survey. The purpose of this study is, after all, to compare the role and function of CMC between the two institutions and as such preference was given to departments that were offered at both institutions. Since the focus was on the academic sector specifically, institutes, centres and bureaus were not included in this survey.

5.7.4 Sample size

Determining the size of a sample is a complicated decision that the researcher has to make. Sample size can be determined by a number of factors. Bailey (1994:97) asserted that the correct sample is dependent upon the nature of the population and the purpose of the study. He identified 30 cases to be the minimum for studies in which data analysis is done. However, when there are several sub-populations to study, many researchers regard 100 cases to be more appropriate (Bailey, 1994:97). The researcher took all these factors into consideration, as well as the need to have an adequate representation of the various strata that related to the potential independent variables of institutional affiliation, age, position, gender and working years. This yielded a sample size of 134 participants.

5.8 Data collection techniques

Leedy & Ormrod (2001:111) identified four fundamental questions about data collection that a researcher needs to address. What data are essential? Where are the data to be found? How will the data be secured? How will the data be elucidated? Data collection constitutes an essential aspect of the research process. During the research process the researcher accumulates a plethora of observed ideas and information. Data should be collected because it is not merely interesting but relevant to the problem or phenomenon under investigation

(Mouton, 1996:110). The collection of data was accomplished through various techniques and the objective was to provide relevant and accurate data, i.e. bearing in mind the methodological criteria of objectivity, systematic and accurate recording of the observations and the creation of optimal conditions for the collection of the data.

The data in this study consisted of secondary data derived from the literature overview of the development of CMC and an overview of the UFH and the UPE, and primary data collected by means of a questionnaire and follow-up interviews.

5.8.1 Questionnaires

Busha and Harter (1980:61) stated that "Questionnaires are often used in surveys as the primary data collection technique. Care must be taken to develop the kind of questions, or survey items that will accurately measure what the investigator wants to know. The purpose of research is to obtain valid and reliable information so that specific hypotheses can be tested or research questions answered".

The researcher evaluated the following disadvantages and advantages of a questionnaire as a data collecting technique to establish its suitability for this study.

Advantages of a questionnaire

- Respondents get a chance to give precise short and anonymous answers (Powell, 1997:90; Busha & Harter, 1980:62).
- Individuals can complete questionnaires in their one time but with an indication of a return date set by the researcher (Powell, 1997:91; Busha & Harter, 1980:62).
- Questionnaires can supply a significant amount of data for a moderately low cost in terms of materials, money and time (Denscombe, 1998:105).
- Data are gathered in a specific time frame (Powell, 1997:91).
- Researchers are prompted to clearly define the research problem, its implication and the nature of the research data required when they construct the questionnaire (Busha & Harter, 1980:62).

Disadvantages of a questionnaire

- They prevent contact with respondents, possibly causing the researcher to gain insufficient information about respondents in a study (Powell, 1997:91).
- Incompetent structuring of questions or direct questions might produce negative feelings or reticence from respondents (Busha & Harter, 1980:63).
- The aim and value of the survey instruments could be disregarded by participants and they may have developed a resistance towards any mail survey (Busha & Harter, 1980:63).
- 'Pre-coded' questions can be annoying for respondents and thus discourage them from responding honestly (Denscombe, 1998:106-107).

Having considered the merits and demerits of questionnaires, the researcher concluded that for this study the advantages outweighed the disadvantages. The researcher, however, took note of Busha and Harter's (1980:63) warning that the investigator has a 'professional responsibility' to ensure a reliable and valid questionnaire. In designing the questionnaire for this particular study, the following principles were thus considered to overcome the above-mentioned problems and disadvantages:

- The researcher gained knowledge about his/her research problem, and endeavoured to articulate precise questions for the survey.
- The investigator requested information that she thought could easily be provided by the respondents.
- Attention was given to brevity and economy of participant effort, without forfeiting an adequate treatment of the subject.
- All items were worded in such a way that questions were 'conceptually valid' to encourage understanding and correctness, and persuade respondents to partake in the research.
- Additional methods were considered in administrating the questionnaire, for example the 'home delivery' method was chosen to build a rapport with respondents.

5.8.1.1 Designing a questionnaire

Dillman (2000:32) cautioned that "the goal of writing a survey question for self administration is to develop a query that every potential respondent will interpret in the same way, be able to respond to accurately, and be willing to answer. However, in practice, producing good questions is often difficult." There are usually two types of questions used in surveys, open-ended (unstructured) questions or questions that are referred to as closed questions (structured). Open-ended questions are generally seen as a supple method, as it permits the researcher to attain a certain depth in response, i.e. through the gathering of new ideas where respondents can answer questions in their own terms and thus give them an amount of freedom (Busha & Harter, 1980:70; University of New South Wales, 2003: online).

Denscombe (1998:101) identified closed questions as having an organising influence on the answer in that it only allows responses "which fit into categories that have been established in advance by the researchers". The investigator introduces the respondents to answers by selecting from a range of two or more options supplied on the questionnaire. Babbie (2002:242) and Bryman (2001:146) identified two structural guidelines which should guide the researcher in constructing closed-ended questions, viz.: the response categories provided should in the first instance be exhaustive and should include all the possible responses that might be expected, but should also leave room for additional information (the typical 'other' category). In the second instance the answers should ideally be mutually exclusive, in other words the respondents should not need to select more than one option in order to answer the question to their satisfaction. The latter aspect is not, however, always attainable as many questions may generate multiple responses. When this occurs the researcher should be aware of the analysis implications.

One of the advantages of closed-ended questions is that it enables the researcher to collect clear-cut and easy to count answers, leading to quantitative data for analysis. This method is relatively economical and large samples of people can be included. It directs to effortlessness of data collection and analysis (Nachmias & Nachmias, 1992:242).

One of the disadvantages of closed-ended questions is the possibility that respondents leave out answers, because they are not covered by the questions and with that, the naturalness of

possible additional ideas by respondents are minimised or eliminated (Busha & Harter, 1980:70). To overcome this, all possible answers should be accommodated, but it can be difficult to make close-ended answers all-embracing. The advantages of open-ended questions are that they are useful for exploratory research to delve into meaning and obtain new ideas. This is a very flexible approach and the researcher can achieve depth in responses (Busha & Harter, 1980:70).

The main disadvantage of open-ended questions is that it requires some skill in asking the question and in interpreting the results. Answers often lack uniformity and require more effort to categorise, count and analyse.

For this study the researcher mostly chose closed-ended questions to assemble clear cut and easy to categorise answers that could be analysed by means of a statistical software package.

The research questions basically attempted to establish:

- What is the status of CMC at the two institutions?
- What is the competency level of academic staff with specific reference to utilising CMC applications in their specific environment?
- To what extent and for what purposes do academics use CMC, particularly e-mail, in their work environment?
- If there are any differences between the two institutions with regard to CMC use ?

The issues addressed by this study are covered in the questionnaire in three clearly demarcated sections, viz.:. **Section A**: Demographic information, **Section B**: Status of CMC and e-mail use, and **Section C**: Application of e-mail. The purpose of **Section A** was to establish the profile of e-mail users at the two institutions by asking them to indicate their age, position, gender and number of working years. **Section B** was designed to ascertain the status of information technology, i.e. to determine the capacity or perceived capacity of e-mail at the two institutions and the academic staff's ability to use this medium. The basic assumption is that the e-mail capacity impacts in one way or another on the use of e-mail. Section B (Questions 6-16) thus addressed the following research questions:

- What is the status of CMC at the two institutions?

- What is the competency level of academic staff with specific reference to utilising e-mail?

Section C addressed the application of e-mail, i.e. for what purposes was e-mail being used and to what extent did it play a role in academic work. The frame of reference of the questions was thus gradually narrowed by asking more specific questions that drilled down to the essential problem being investigated. Section C (Question 17-24) thus investigated the following research question:

- To what extent and for what purposes do academics use CMC, particularly e-mail, in their work environment?

The final question was addressed by all three sections of the survey:-

- Are there any differences between the two institutions with regard to CMC use ?

5.8.1.2 Distribution of the questionnaire

The researcher can utilise various ways to administer the questionnaire. Singleton (1993:258-259) was of the opinion that creating a questionnaire as a survey data-collection tool necessitated time and other logistical considerations (i.e. who should do what, where, when and how?).

Babbie (2002:253) identified the following three key methods of administering the survey questionnaires to a sample: structured interviews, self-administered questionnaires and telephone interviews. Electronic mail distribution of questionnaires is another option. The decision regarding the distribution method forms part of the planning of the survey and depends partly on aspects such as the objectives of the study, units of analysis and sampling plan. A crucial decision in a survey is which of the above-mentioned methods to use or whether to rather employ an amalgamation of these approaches.

Face-to-face and telephone interviews require trained and knowledgeable interviewers who are capable of using interview techniques. The advantages of this form of questioning include the ability of an interviewer to explain or reiterate questions that the respondents are

not certain about (Singleton, 1993:258-259). Another advantage is that interview surveys generate a smaller number of incomplete questions (Babbie, 2002:271).

When using electronic mail to distribute questionnaires the researcher should be aware that the response is usually notoriously low. Further disadvantages of this form of deliverance are that the respondents can easily delete e-mail, or the IT network might be unreliable and as such prevent the data from being delivered or collected in return.

Babbie (2001:257) noted that the most common form of questionnaire delivery is the mail or self-administered survey. This is one of the most cost- effective methods, though the initial cost is relatively high for printing. The disadvantages of self-administered questionnaires are that they allow no opportunity to clarify questions, probe for more adequate answers, or control the conditions under which the questionnaire is completed or even who completes it.

After considering the different types of questionnaire distribution methods, the researcher decided to employ a variant of the self-administered questionnaire, i.e. to utilise the 'home delivery method'. The sampling plan required that the researcher investigated two independent institutions that are geographically removed from each other. The geographical separation necessarily creates certain logistical difficulties that ruled out both face-to-face and telephone interviews. The latter are too expensive, time consuming and impractical and therefore the 'home delivery method' was used.

In the 'home delivery' or the 'drop-off-method' the researcher (or assistant) delivers the questionnaire, in this case to the office of the respondents, and explains the study. The questionnaire is then left for the respondents to complete, and the researcher picks it up later. On the whole, when a researcher either delivers the questionnaire or picks it up, or both, the completion rate is generally higher than for mail surveys. In this study the researcher, or her assistant, distributed the instrument to respondents in the various departments allocated for this study at the two institutions. The 'home delivery' questionnaire allows the participants to complete the questionnaire in privacy and when it suits the respondents but it also allows the researcher to make personal contact with the respondents and give information if necessary. Respondents were given one week to complete the instrument. The questionnaires were collected by the researcher at UFH. At UPE an assistant (instructed by

the researcher) distributed and collected the questionnaires. In some instances the researcher was contacted by respondents telephonically when they were unsure of questions.

The collection and distribution of the survey instrument were conducted over a three-week time span. The researcher ensured that at both institutions similar departments were represented in each of the designated faculties. A total of 134 questionnaires were distributed to make up the sample size. The researcher received 104 questionnaires back; 50 from UFH and 54 from UPE. This gave an acceptable return rate of 77.6%.

5.8.2 Interviews

Apart from data derived from the questionnaires, the researcher also collected information through personal interviews. These unstructured interviews were primarily conducted to obtain additional information and to clarify certain aspects with regard to the research project. The researcher made appointments with individuals who were willing to participate. Eight participants were interviewed from both universities. The researcher ensured that individuals were chosen in such a way that each category (i.e. junior lecturer, lecturer, senior lecturer and associate and full professors) were presented. The purpose and method of the investigation was explained, and the respondents were asked to clarify ambiguities that arose out of the questionnaire study. Rubin and Babbie (1997:388) refer to this form of interview as "informal conversational interviews" which is the most open-ended form of interviewing, but a still a very useful and valid method to collect survey data.

5.8.3 Documentary sources

In addition to the abovementioned methods, data were collected from the literature and reports (Chapters 2, 3 & 4).

5.9 Pilot study

Walliman (2001:238) noted that "a questionnaire should be pre-tested on a small number of people in what is called a pilot study. It is best to test it on people of a type similar to that of the intended sample, so as to anticipate any problems of comprehension or the source of

confusion."

Pre-testing of a survey instrument is necessary to ensure the validity of the survey. In the pilot study volunteers were made aware of the purpose of the survey and an explanation was given as to the importance of the study and that their participation was very important and valued. The pre-test was distributed to twenty-five participants drawn from the institutions. Instructions were given to them on how to complete the questionnaire. Respondents were told that if any clarification was needed about any question, the researcher could be contacted. Participants indicated that the questionnaire questions were well understood. The pilot study further sensitized the researcher about the time factor and respondents were thus notified well in advance before the actual instrument was handed to them.

The pilot study allowed the researcher to identify problems with the instrument and the data collection process. The researcher took note of the respondents' recommendations and suggestions, and their perceptions were taken into account in the editing of the questionnaire.

5.10 Reliability and validity

It is generally accepted that research is considered to be valid when the conclusions are true (valid), and reliable when the findings are repeatable (reliable) (Powell, 1997:37).

The validity and reliability of the data that are collected and analyzed are of importance in as far as it impacts on the integrity of the scientific discourse, i.e. the objectivity of the research results (Powell, 1997:37).

Reliability

Reliability has to do with the quality of measurement, i.e. "reliability is a matter of degree" (Katzer et al. 1991:104). Busha and Harter (1980:8) defined reliability in using it "to characterize stable, consistent, and dependable research methods, instruments, data, or results". Specifically in the sense that there should be "Verisimilitude between the theoretical explanations regarding any aspect of reality and that specific aspect of reality under investigation" (Mouton & Marais, 1985:15). Mouton and Marais (1985:79) and Mouton

(1996:144-145) identified various aspects that have an impact on the integrity of any research project and which should be taken into consideration during the research process in order to ensure the highest possible extent of reliability:

- the objectiveness of the researchers and understanding of the research questions
- poorly developed measuring instrument
- research context that is not clearly demarcated and identified

De Vaus (2001:31) added that by asking questions about which people have insufficient information or require too precise responses, can lead the researcher to obtaining unreliable data.

Mouton and Marais (1985:41-42) and Leedy & Ormrod (2001:31-32) identified two aspects that pose a threat to the reliability and validity of research projects. The first is the extent to which the sample unit can be regarded as truly representative of the population, and the second is the error of reductionism whereby the researcher singles out one explanation as being sufficient.

The reliability and validity of research should not be seen in isolation from the context or the research setting (Mouton & Marais, 1985: 88-89). Given the ever-changing landscape of tertiary education, as well as information technology, the researcher focused on a specific period, i.e. a cross-sectional approach was followed whereby the questionnaire provided data as perceived by the respondents in 2001. The researcher endeavoured to show consideration for the aforementioned principles to enhance the reliability of the investigation. The questionnaire was submitted – in person – to the various respondents at the two institutions, thus enabling the researcher to establish a rapport with the respondents. Other factors that were taken into consideration were that the anonymity of the respondents was ensured. The sampling process used strived to draw participants that were representative, bearing in mind the diverse circumstances at the two institutions in question. The researcher conducted the investigation during September 2001.

Validity

Generally speaking, the term validity refers to the extent to which an empirical measure

adequately reflects the real meaning of the concept under consideration (Rubin & Babbie, 1997:177).

Bailey (1982:68) describes validity in terms of the following basic principles:

- The measuring instrument should measure the intended concept or aspect under investigation in a research project.
- The research questions should be measured accurately.

Katzer (et al. 1991:107) refers to the abovementioned as 'construct validity' where, in trying to understand a certain concept, one needs to measure that specific concept, and, not something else, accurately.

The researcher improved the accuracy of the survey instrument by utilising questionnaires as data collection tool. The questionnaire was developed in such a way as to circumvent subjectiveness and vagueness. The validity of the questionnaire was further enhanced by conducting a pilot study among a sub-set of respondents on which the original study based its findings. This exercise was necessary to identify problems and possible shortcomings. The objective of the questionnaire used in this study was to elicit information on the use of e-mail for academic purposes in an environment such as the UPE and the UFH. In addition, general issues relating to the use of e-mail technology were posited.

5.11 Data processing, coding and analysis

Apart from the collection of the data the analysis, interpretation and reporting of the results form an integral part of the study. Katzer et al. (1991:114) cautioned that the researcher should not just arrive at 'idiosyncratic observations', i.e. "subjective perspectives on an accidental conclusion, based on a superficial analysis of great masses of data". The objective of this study functioned as a general guideline to determine which information (data) was relevant. According to Rubin and Babbie (1989:456), "The task here is to reduce a wide variety of idiosyncratic items of information to a limited set of attributes composing a variable." This consideration assisted the researcher to attain a reliable perspective, based on relevant data that was collected and analysed as rigorously as possible. The data therefore

needs to be summarised in order to discern and report on specific patterns or trends. The data processing and analysis is reported in detail in Chapter 6.

5.12 Conclusion

Bailey (1994:34) sees the research method as the research tool or technique to collect the required data that could consist of various aspects, such as reviews of relevant literature, questionnaires, sampling etc. An important characteristic of descriptive studies is providing a precise measurement or technique, and to give an account of the characteristics of the phenomenon being studied.

In this chapter, attention was given to the methodological considerations pertaining to the research process, including the information sources and nature of the data. Attention was given to using a questionnaire as data collection instrument. Attention was also given to the design and structure of the questionnaire. The purpose of the questionnaire was primarily to establish the role/ status of e-mail, and to test the respondent's perception regarding the role of e-mail within their work environment.

CHAPTER 6

ANALYSIS OF THE DATA

6.1 Introduction

The analysis of the data was done in accordance with the research objectives of this study. That is, to investigate the role and function of e-mail in an academic environment; to specifically establish its significance in the research activities of the academic endeavour; to compare the responses obtained from the University of Fort Hare with that of Port Elizabeth; and to see if any of the other independent variables had an effect on the function and role of e-mail in the academic environment.

The Statistical Package for the Social Sciences (SPSS) was used to analyse the data. The qualitative data were analysed by means of non-parametric statistical methods such as percentage tables to describe the situation and 2x2 cross-tabulations were used to analyse and compare variables. The majority of the results pertain to qualitative data. In the instances where quantitative data were collected, parametric methods were applied and tables indicating averages and standard deviation were produced.

The Pearson chi-square test was used to establish the significance of non-parametric data while the Annova test was used to test the significance of the parametric data. Statistical results below the .05 level were rejected. This chapter reports the factual data analysis while the summary interpretation and concluding remarks for this chapter will be presented in chapter 7.

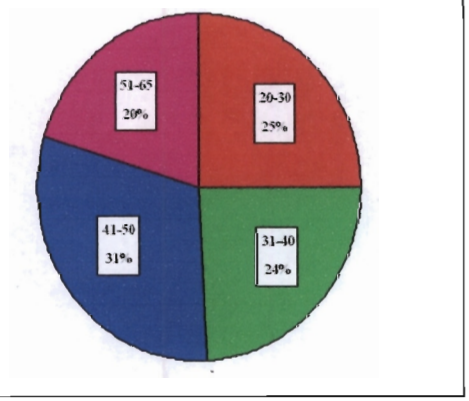
6.2 Demographic profile (Section A)

In this section the data that describes the demographic distribution of the sample is presented (cf. Questions 1-4 and preliminary information). The differences between the sample distributions (for each question) will be indicated for the two institutions.

6.2.1 Distribution by age (Question 1)

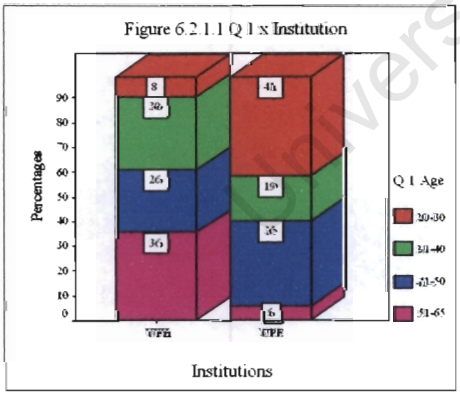
The age distribution for the sample was fairly equal with comparable strata for each category, viz.: the younger age category (20-30 years) contained 25% of the sample, the next age group (31-40) comprised 24% of the sample, the 41-50 age category contained 31%, and the oldest group (51-65 years) consisted of 20% of the sample (cf. Figure 6.2.1 below).

Figure 6.2.1 Age



6.2.1.1 Distribution of age by institutional affiliation (Question1)

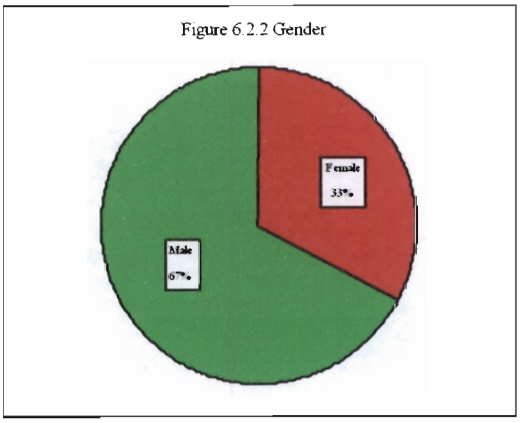
Figure 6.2.1.1 Q 1 x Institution



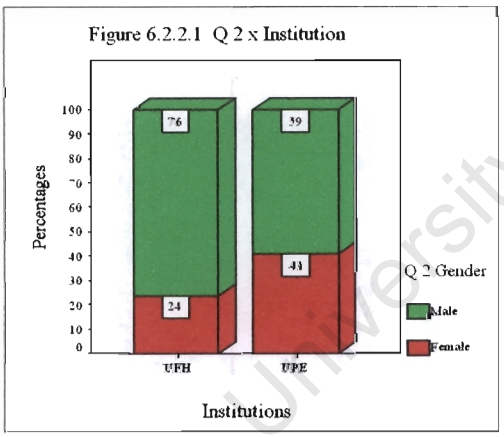
From Figure 6.2.1.1 it can be seen that the age distribution differs considerably between the two institutions: UFH had a far greater representation in the oldest age category (51-65 years), and the 31-40 age category than UPE (36% vs 6% and 30% vs 19% respectively). UPE in turn had younger academics, i.e. 41% vs. 8% for the 20-30 age category. They also had more academics in the 41-50 age category (35% vs 26%).

6.2.2 Distribution by gender (Question 2)

Figure 6.2.2 reflects the gender difference within the sample. It can be seen that 67% of the respondents were male and only 33% female.



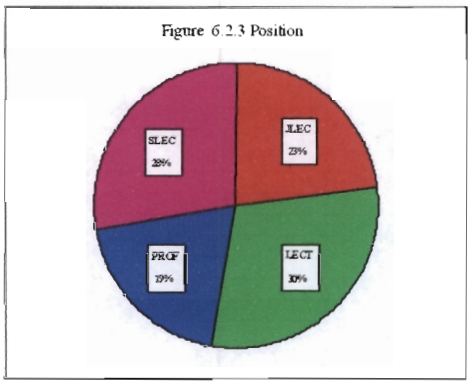
6.2.2.1 Distribution of gender by institutional affiliation (Question 2)



From Figure 6.2.2.1 above it is clear that the gender distribution at UFH was far more skewed (76 % males vs 24% females) than at UPE where a more equitable distribution of 59% males against 41% females was found.

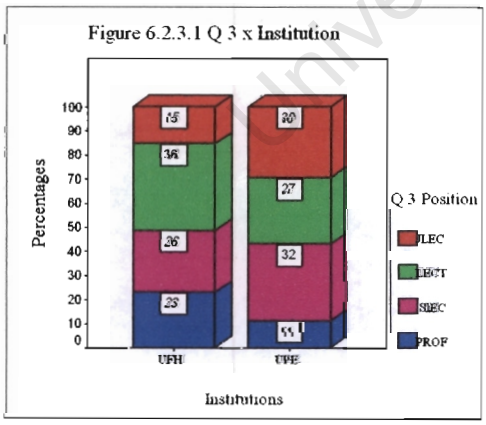
6.2.3 Distribution by position (Question 3)

Figure 6.2.3 below depicts the distribution by position for the total sample. The sample contained 23% of the junior lecturer category, 30% of the lecturer category and 28% of the senior lecturer category. The final group, comprising of associate and full professorial [1] levels, constituted 19% of the total sample.



From Figure 6.2.3 it can be seen that the total sample reflected a fairly equal distribution of position categories from junior to senior lecturer, and as can be expected, a lower number of respondents in the professorial category.

6.2.3.1 Distribution by position and institution affiliation (Question 3)



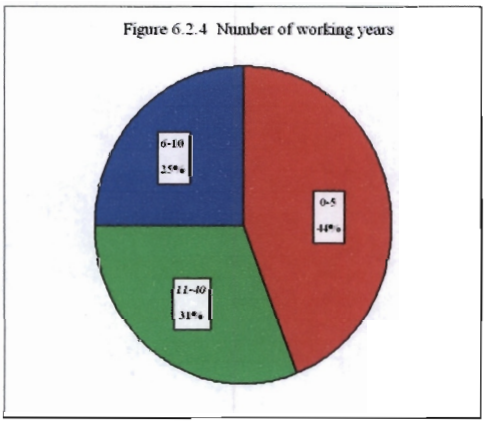
From Figure 6.2.3.1 it can be seen that the UFH and UPE sample distribution by position was fairly similar with only a few more respondents at lecturer (36%) and professorial

[11] The latter category will be referred to as the professorial category for ease of reference.

(23%) level at UFH and slightly greater presentation of junior (30%) and senior lecturers (32%) at UPE.

6.2.4 Distribution by number of working years (Question 4)

Figure 6.2.4 below depicts the distribution of the sample according to the number of working years. The following emerged: 44% of the respondents indicated that they had worked for five years or less, 25% respondents worked for 6-10 years, and 31% respondents worked for more than 10 years .

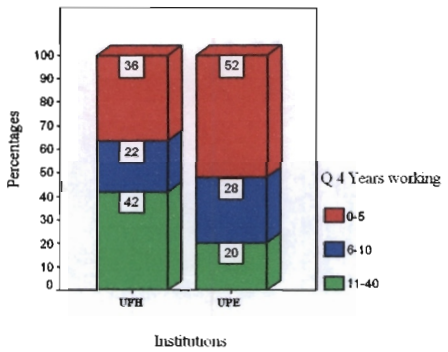


It was clear that the largest proportion of respondents had worked for five years or less and over two thirds had worked for ten years or less.

6.2.4.1 Distribution by institution affiliation and number of working years (Question 4)

UFH and UPE had the following distribution by number of working years (cf. Figure 6.2.4.1. below).

Figure 6.2.4.1 Q 4 x Institution



From the above it can be seen that the majority of the UPE respondents had worked for five years or less, whilst the greatest proportion (42%) of the UFH respondents had worked for more than 10 years (cf. Figure 6.2.4.1 above).

6.3 Status of information technology at the two institutions (Section B)

In this section the data obtained from the respondents relating to availability and use of IT and of CMC applications are outlined. Each section that covers the total sample will be followed by the cross-tabulation with the independent variables that showed a significant chi-square statistic of .05 or better.

6.3.1 Access to personal computers in own office (Question 5)

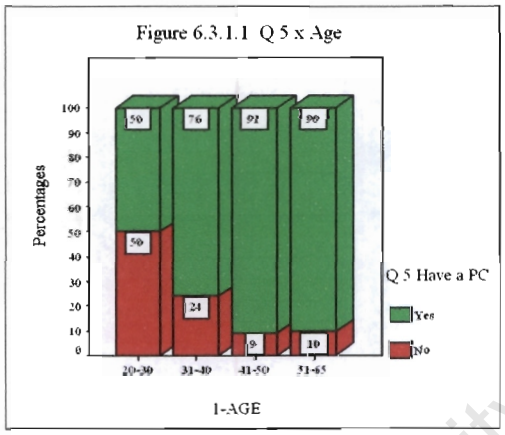
Figure 6.3.1 depicts respondents' response to whether they had access to a personal computer in their own offices. The majority of respondents (77%) had access while only 23% of the respondents indicated that they had no access to a personal computer in their offices.

Figure 6.3.1 Personal Computer

If the data were further analysed and cross-tabulated with the independent variables of institutional affiliation, age, gender, position and number of working years, only age and gender showed significance if the Pearson chi-square test was calculated. These results are discussed in 6.3.1.1 and 6.3.1.2.

6.3.1.1 Age cross-tabulated with access to a personal computer in own office (Question 5)

The observed differences between the responses for the various age categories were significant at the .001 level. Figure 6.3.1.1 depicts access to a personal computer according to the various age categories.

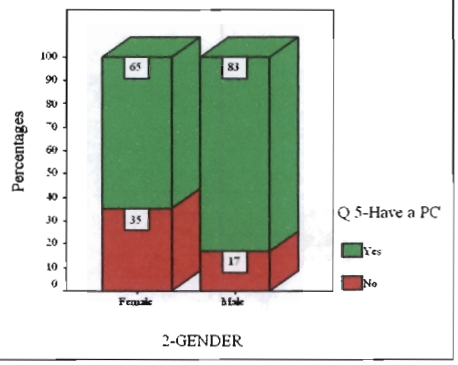


It was clear that a distinct pattern emerged. With increase in age there was an increase in access to a computer in the respondents' own office, ranging from a 50% access rating within the 20-30 age category to a 91% and 90% access rating in the 41-50 and 51-65 age categories respectively.

6.3.1.2 Gender cross-tabulated with access to a personal computer in own office (Question 5)

The observed difference was at the .037 level for the Pearson chi-square test.

Figure 6.3.1.2 Q 5 x Gender

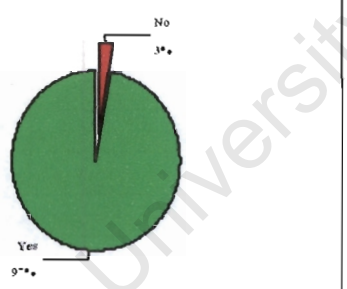


From Figure 6.3.1.2 it was evident that significantly more male respondents (83%) had access to personal computers in their offices than their female (65%) counterparts.

6.3.2 Familiarity with e-mail (Question 6)

Figure 6.3.2 depicts respondents' familiarity with e-mail. The vast majority (97%) of respondents indicated that they were familiar with e-mail.

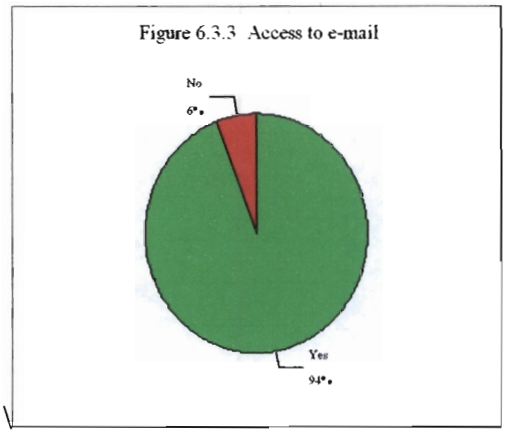
Figure 6.3.2 Familiar with e-mail



If the data were further analysed and cross-tabulated according to the independent variables, the Pearson chi-square statistic showed no significant results.

6.3.3 Access to e-mail (Question 7)

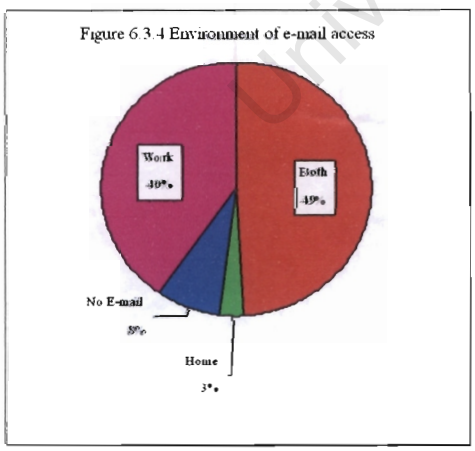
Figure 6.3.3 depicts respondents' access to e-mail as reflected by the total sample. The vast majority (94%) of respondents indicated that they had access to e-mail.



If the data were further analysed and cross-tabulated with the independent variables of institutional affiliation, age, gender, position and number of working years, no significance showed if the Pearson chi-square statistic was calculated.

6.3.4 Environment of e-mail access (Question 8)

Figure 6.3.4 indicates the place where respondents access their e-mail, i.e. at work, at home or both. From the responses it was clear that almost half of the respondents (49%) had access to e-mail both at their homes and at work, while 40% had access to e-mail at work only. Only 3% indicated that their only access was at home. Eight percent (8%) of respondents indicated that they had no access to e-mail facilities.



It was interesting to note the high percentage of respondents that had access to e-mail both at home and at work. If the data were further cross-tabulated with the independent

variables, only institutional affiliation and position showed a significant Pearson chi-square statistic. These results are discussed in 6.3.4.1 and 6.3.4.2.

6.3.4.1 Institutional affiliation cross-tabulated with environmental access to e-mail (Question 8)

The observed difference between respondents for environment of access to e-mail cross-tabulated with institutional affiliation was significant at the .004 level. E-mail access according to institution is outlined in Table 6.3.4.1 below.

Table 6.3.4.1 Environment of e-mail access	Work	Home	Both	No E-mail
Institution				
UFH	46%	6%	34%	14%
UPE	35%	0%	63%	2%

The difference between the UFH and UPE respondents with regard to the environment of e-mail use was as follows: more UFH respondents had access either only at work (46% vs 35%) or only at home (6% vs 0%), or had no access (14% vs 2%) than their UPE counterparts. A major proportion (63%) of the UPE respondents in contrast to their UFH counterparts (34%), had access both at home and at work.

6.3.4.2 Position cross-tabulated with access to personal computer (e-mail) in a specific environment (Question 8)

The observed differences between the respondents for environment of e-mail access cross-tabulated with position were significant at the .05 level, and are depicted in Table 6.3.4.2 below.

Table 6.3.4.2 Environment of e-mail access	Work	Home	Both	No E-mail
Position				
Junior Lecturer	54%	0%	46%	0%
Lecturer	48%	4%	32%	16%
Senior Lecturer	28%	0%	66%	7%
Associate & Professorial	30%	10%	55%	5%

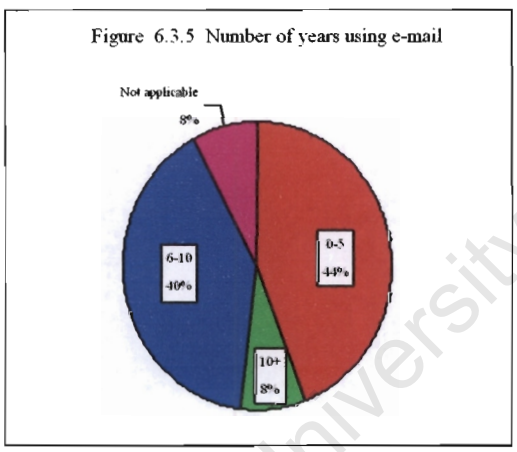
From the above it is clear that the more junior positions (junior lecturer and lecturer) were less likely to have access to e-mail both at home and work than the more senior categories (senior lecturer and the professorial category). The majority of the junior lecturers (54%)

and (48%) of the lecturers had access at work only and this preponderance changed to only 28% of the senior lecturers and 30% of the professorial category. Another interesting observation was that all of the junior lecturers had access to e-mail but did not necessarily own a computer in their own office. A surprisingly high percentage of the lecturer category had no e-mail access (16%). Another surprising outcome was that 10% of the professorial category had access only at home.

6.3.5 Number of years using e-mail (Question 9)

Of the total sample 44% of the respondents had used e-mail for less than five years, 40% had used e-mail for more than five years and less than 10 years, while only 8% of the respondents had used e-mail for more than 10 years. Eight percent (8%) of respondents indicated 'not applicable' as a response (cf. Figure 6.3.5 below).

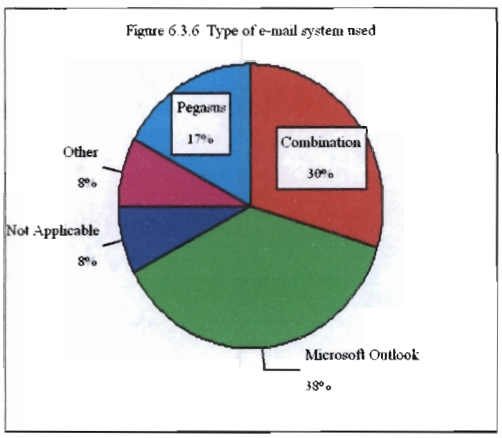
Figure 6.3.5 Number of years using e-mail



It was thus clear that the vast majority of respondents (84%) had used e-mail for less than 10 years, an expected result, taking into consideration the recency of e-mail use in general. If the data for Question 9 were further analysed and cross-tabulated with the independent variables, the Pearson chi-square test showed no significant results.

6.3.6 Type of e-mail system used (Question 10)

Figure 6.3.6 shows the types of e-mail systems[2] used by the respondents. The Microsoft Outlook e-mail system was used by 38% of respondents. Pegasus and Microsoft Outlook e-mail systems were used in combination by 30% of respondents. The Pegasus e-mail system alone was used by 17% of respondents. Only 8% use other e-mail systems and 8% did not use an e-mail system.



From the above it is clear that Microsoft Outlook alone and in combination with Pegasus was the most used e-mail system (68%). If the data were further analysed and cross-tabulated with the independent variables, only institution and age showed significant Pearson chi-square results. These results are discussed in 6.3.6.1 and 6.3.6.2.

6.3.6.1 Institutional affiliation cross-tabulated with type of e-mail system used (Question 10)

The observed difference in the institutional use of e-mail systems was significant at the .002 level. Table 6.3.6.1 depicts the use of e-mail systems by respondents according to institutional affiliation.

Table 6.3.6.1 Type of e-mail system used	Pegasus	Microsoft Outlook	Combination	Other	Uncertain
Institution					
UFH	6%	30%	40%	10%	14%
UPE	28%	44%	20%	6%	4%

[2] The term e-mail system is used in preference to other concepts such as e-mail client application software.

It was clear that more UFH respondents used a combination of e-mail systems (Microsoft Outlook and Pegasus) (40% vs 20%) or were uncertain what they use (14% vs 4%) than their UPE counterparts. The latter, in turn make greater use of only Pegasus (28% vs 6%) or only Microsoft Outlook (44% vs 30%) e-mail systems.

6.3.6.2 Age cross-tabulated with the type of e-mail system used (Question 10)

The observed differences between the responses for the various age categories were significant at the .002 level.

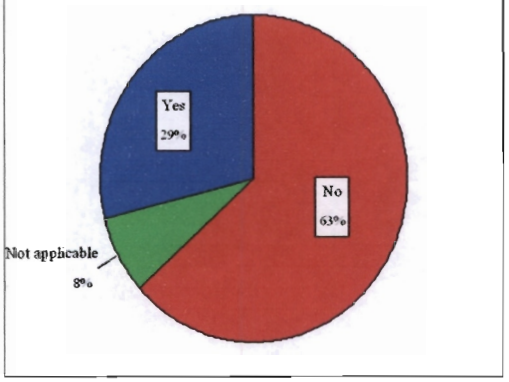
Table 6.3.6.2 Type of e-mail system used	Pegasus	Microsoft Outlook	Combination	Other	Uncertain
Age					
20-30	27%	50%	12%	4%	8%
31-40	20%	32%	36%	6%	8%
41-50	16%	28%	34%	19%	3%
51-65	5%	43%	38%	0%	14%

From Table 6.3.6.2 it is clear that the younger respondents (20-30 age category) made the most use of the Microsoft Outlook e-mail system (50%) only followed by Pegasus only (27%), while only 12% used a combination. The 31-40 age group's had a far more equal distribution among the two main systems only and a combination approach (20%, 32% and 36% respectively). The 41-50 age category followed the previous age groups' pattern except for their far greater use of the 'other' systems (19%). The largest proportion of the oldest age category (43%) used only Microsoft Outlook, followed closely by those who used both Microsoft Outlook and Pegasus (38%). This latter category had a surprising number of respondents (14%) who were uncertain.

6.3.7 Training in the use of e-mail (Question 11)

Figure 6.3.7 depicts training received by respondents for the total sample. The majority of respondents (63%) indicated that they received no e-mail training while 29% indicated that they received e-mail training. Eight percent (8%) returned an uncertain response for this item.

Figure 6.3.7 Training in the use of e-mail

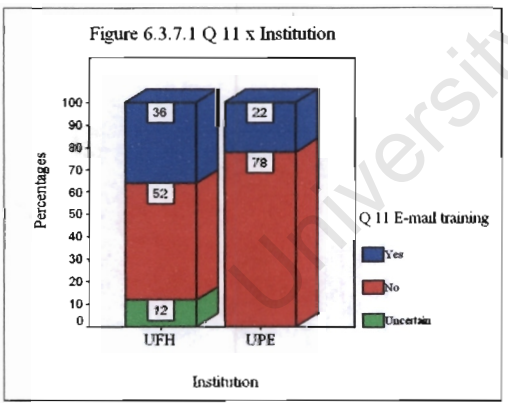


If the data for Question 11 were further analysed and cross-tabulated with the independent variables, only institutional affiliation showed a significant Pearson chi-square test result. This result is discussed in 6.3.7.1.

6.3.7.1 Training in the use of e-mail cross-tabulated with institutional affiliation (Question 11)

The observed differences were significant at the .018 level, and Figure 6.3.7.1 illustrates the observed differences between institutional affiliation and e-mail training.

Figure 6.3.7.1 Q 11 x Institution

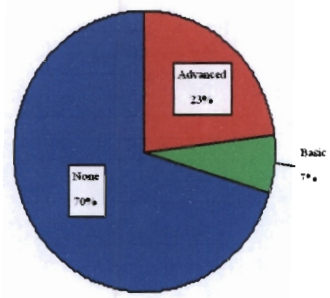


It was evident that more UFH respondents received training (36%) than their UPE counterparts (22%).

6.3.8 Type of e-mail training received (Question 12)

Figure 6.3.8 indicates that 23% respondents indicated that they received advanced training, 7% received basic training and the vast majority received no training (70% included the not applicable result).

Figure 6.3.8 Type of training

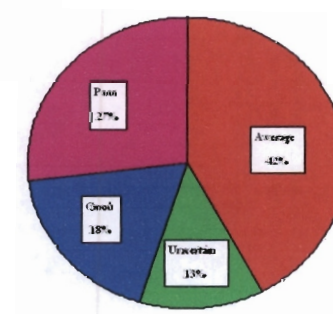


Further analysis of the data by cross tabulating it with the independent variables did not yield a significant Pearson chi-square statistic.

6.3.9 Rating of the e-mail connectivity, stability and reliability (Question 13)

Figure 6.3.9 below reflects how respondents rated the stability, connectivity and reliability of the e-mail network. A large number of respondents (42%) rated the network as average. A sizeable number of respondents (27%) rated the e-mail network as poor, while only 18% of the respondents were satisfied with the e-mail network and 13% respondents were uncertain.

Figure 6.3.9 Network rating

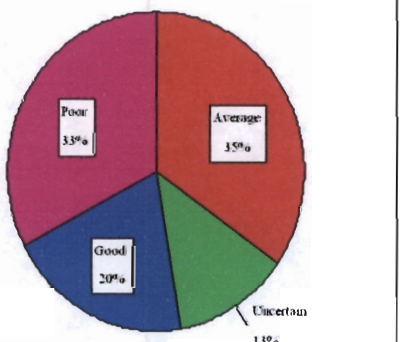


If the data for Question 13 were further analysed and cross-tabulated with the independent variables, the Pearson chi-square statistic did not indicate significant results.

6.3.10 Information technology support [3] (ITS) (Question 14)

The respondents' satisfaction with information technology support is reflected in Figure 6.3.10 below.

Figure 6.3.10 Information technology support



It was clear that only 20% rated it good, 35% of the respondents rated the information technology support as average and 33% rated it as poor. If the data for Question 14 were further analysed and cross-tabulated with the independent variables, only institutional affiliation showed a significant Pearson chi-square test result. The result is discussed in 6.3.10.1.

6.3.10.1 Institutional affiliation cross-tabulated with information technology support (Question 14)

The observed differences between the responses for the various institutions were significant at the .001 level. The following emerged for information technology support received by the respondents.

[3] For clarity and consistency, the researcher decided to use the term Information Technology Support for both institutions regarding any technical support for e-mail and CMC applications.

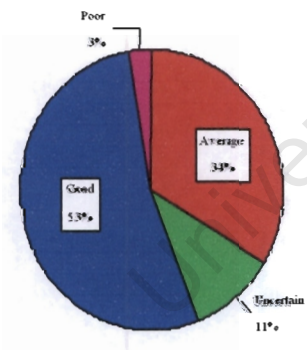
Table 6.3.10.1 Information technology support (ITS)	Good	Average	Poor	Uncertain
UFH	4%	40%	38%	18%
UPE	35%	30%	28%	7%

From Table 6.3.10.1 it is clear that the UPE respondents rated their IT support much higher than their UFH counterparts.

6.3.11 The respondents' rating of their own competency level with reference to the e-mail system they are using (Question 15)

Figure 6.3.11 reflects the respondents' competency rating with regard to the e-mail system they were using. The majority of respondents rated their own competency as good (53%) followed by average (34%). Only 3% of the respondents indicated their competency as poor, while 11% were uncertain.

Figure. 6.3.11 Competency rating

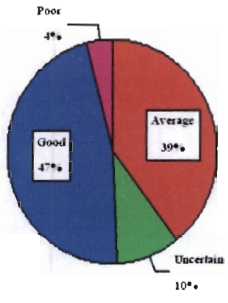


Further analysis of the data by cross-tabulating it with the independent variables institution, age, gender, position and number of working years, showed no significance if the Pearson chi-square test was calculated.

6.3.12 Functionality of e-mail systems (Question 16)

Figure 6.3.12 reflects the respondents' satisfaction with the e-mail systems' functionality. A large proportion of the respondents indicated that the e-mail systems function well (47%) or average (39%), and only 4% rated the systems as poor. A small number of respondents (10%) were uncertain.

Figure 6.3.12 Functionality of e-mail systems



If the data for Question 16 were further analysed and cross-tabulated with the independent variables, only position showed a significant Pearson chi-square statistic. This result will be discussed in 6.3.12.1.

6.3.12.1 Position cross-tabulated with the of e-mail system functionality (Question 16)

The observed differences between the responses for the various positions were significant at the .001 level. The following emerged for e-mail system functionality as perceived by the various position categories.

Table 6.3.12.1 Functionality of e-mail systems	Good	Average	Poor	Uncertain
Position				
Junior Lecturer	42%	58%	0%	0%
Lecturer	32%	42%	6%	19%
Senior Lecturer	59%	31%	0%	10%
Professorial	60%	25%	10%	0%

From Table 6.3.12.1 it is clear that the senior lecturer and professorial categories were more satisfied (59% and 60%) with the functionality of the e-mail systems they were using then the more junior categories. The more junior categories were more inclined to rate their e-mail systems as average (58% and 42%). The only categories who rated the functionality of the e-mail as poor were the lecturers (6%) and the professors (10%). Nineteen percent (19%) of lecturers, 10% of senior lecturers were uncertain. A very broad generalised observation that can be made is the more senior respondents were more satisfied with the e-mail systems' functionality than their junior counterparts.

6.4 Application and use of e-mail (Section C)

In this section the respondents were asked to comment on their use of e-mail in their various academic and general communication activities.

6.4.1 General use of e-mail for communication purposes in the work environment (Questions 17.1-17.6)

The respondents were asked to indicate their use of e-mail for communication purposes, as well as to rate their level of use of each category on a scale of 0-100.

Table 6.4.1 reflects the responses to questions 17.1-17.6. The rated response indicated that the most used communication application of e-mail was for routine work (40%), followed by private conversation (21%), communication with colleagues (19%) and communication with students (9%). Only 9% of the respondents did not use e-mail for communication purposes and 2% of the respondents indicated that they used other communication applications.

Table 6.4.1 The use of e-mail for communication purposes	17.1 routine	17.2 private	17.3 students	17.4 colleagues	17.5 not applicable	17.6 other use
	40%	21%	9%	19%	9%	2%

The data were further analysed by cross tabulating the responses to questions 17.1-17.6 with the independent variables. The only statistically significant results were as follows:

		Annova
Institution	17.3. Communication with students 17.4. Communication with colleagues	.000 .030
Age	17.2. Private conversation	.028
Gender	17 4. Communication with colleagues	.024
Position	17.2. Private conversation	.000
Number of Working years	17. 2. Private conversation	.000

These results are discussed in 6.4.1.1, 6.4.1.2, 6.4.1.3, 6.4.1.4 and 6.4.1.5.

6.4.1.1 Institution cross-tabulated with student and colleague communication (Questions 17.3 and 17.4)

It was clear that the UPE respondents communicated significantly more with their students than the UFH respondents (14% vs 4%) and in turn the Fort Hare respondents communicated significantly more with their colleagues than their Port Elizabeth counterparts (24% vs 15%) when using e-mail (cf. Table 6.4.1.1).

Table 6.4.1.1 The use of e-mail for	**17.3 communication with students**	**17.4 communication with colleagues**
Institution		
UFH	4%	24%
UPE	14%	15%

6.4.1.2 Age cross-tabulated with private conversation (Question 17.2)

If the various age categories were cross-tabulated with questions 17.2 it can be seen that the youngest respondents (20-30 years) used e-mail more frequently (33%), than their older counterparts for private conversation. The oldest group (51-56) used this medium for private conversation the least (10%).

Table 6.4.1.2 The use of e-mail for	**17.2 private conversation**
Age	
20-30	33%
31-40	18%
41-50	22%
51-65	10%

6.4.1.3 Gender cross-tabulated with colleagues for private conversation (Question 17.4)

If the responses to question 17.4 were cross-tabulated with gender it was found that 22% of male respondents indicated they used e-mail to communicate with colleagues while only 13% of the female respondents used this medium for this purpose (cf. Table 6.4.1.3).

Table 6.4.1.3 The use of e-mail to	17.4 communication with colleagues for private conversation
Gender	
Female	13%
Male	22%

6.4.1.4 Position cross-tabulated with private conversation (Question 17.2)

If the responses to question 17.2 were cross-tabulated with position, significant differences were found with regard to the different position categories. The junior lecturers (38%) made by far the most use of e-mail for private conversation purposes. The other categories made far less but fairly comparable use of e-mail for private conversation, ranging from 18% use by the lecturers to 17% for the senior lecturers and 14 % by the professorial category.

Table 6.4.1.4 The use of e-mail for	17.2 private conversation
Position	
Jlect	38%
Lect	18%
Slect	17%
Prof	14%

6.4.1.5 Number of working years cross-tabulated with private conversation (Question 17.2)

If the responses to question 17.2 were cross-tabulated with the number of years working at their institution it can be seen the respondents with the least number of working years made by far the most use of e-mail for private conversation purposes (35%) and those with the most number of working years (6-10 years and 11 + years) the least (13% and 9%) (cf. Table 6.4.1.5).

Table 6.4.1.5 The use of e-mail for	17.2 private conversation
Number of working years	
0-5	35%
6-10	13%
11+	9%

6.4.2 The use of e-mail to communicate with students (Questions 18.1-18.5)

The respondents were further asked to indicate what specific purpose they used e-mail for communication with students, and to rate their level of use of each category on a scale of 0-100.

Table 6.4.2 reflects the respondent's reaction to Questions 18.1-18.5. It can be seen that a high (50%) percentage of respondents didn't use this medium to communicate with students at all. The rated response indicated that the most used application of e-mail for communication with students was for routine purposes (23%), then for research purposes (15%), followed by teaching (10%), and only 2% used it for other purposes.

Table 6.4.2 Use of e-mail to communicate with students for	18.1 routine purposes	18.2 teaching purposes	18.3 research purposes	18.4 not applicable	18.5 other purposes
	23%	10%	15%	50%	2%

The data were further analysed by cross tabulating the responses to questions 18.1-18.5 with the independent variables. The only statistically significant result was as follows:

		Annova
Institution	18.1 Communication with students for routine purposes	.008

This result will be discussed in 6.4.2.1.

6.4.2.1 Institutional affiliation cross-tabulated with communication with students for routine purposes (Question 18.1)

It can be seen that significantly more UPE respondents (31%) used e-mail to communicate with their students for routine purposes as compared with UFH respondents of whom only 13% used this medium for this purpose (cf Table 6.4.2.1).

Table 6.4.2.1 Communication with students for	18.1 routine purposes
Institution	
UFH	13%
UPE	31%

6.4.3 The level at which e-mail is used to communicate with colleagues,i.e. on an international, national, university or scholarly communication network level (Questions 19.1-19.5)

The respondents were asked to indicate their use of e-mail to communicate with colleagues on an international, national, university and scholarly network level, as well as to rate their level of use of each category on a scale of 0-100.

Table 6.4.3 below reflects the respondents' reaction to questions 19.1-19.5. Only 27% of the respondents didn't use this medium to communicate with their colleagues. The rated responses indicated that the most used application of e-mail was for communication within their own university with other academics (24%), followed closely by communication with colleagues on a national level (22%), communication with individual colleagues on an international level (17%), while only 10 % communicate via a scholarly network (cf. Table 6.4.3) below.

Table 6.4.3. Academic communication with colleagues at various levels	19.1 international level	19.2 national level	19.3 university level	19.4 network level	19.5 not applicable
	17%	22%	24%	10%	27%

The data were further analyzed by cross tabulating the responses to question 19.1-19.5 with the independent variables. The only statistically significant results were as follows.

Institution	19.2. Academic communication with colleagues on a national level	.033
	19.3. Academic communication with colleagues at university level	.008
Age	19.1. Academic communication with colleagues on an international level	.029
Gender	19.1. Academic communication with colleagues on an international level	.002
	19.2. Academic communication with colleagues on a national level	.024
Position	19.1. Academic communication with colleagues on an international level	.005

These results are discussed in 6.4.3.1, 6.4.3.2, 6.4.3.3 and 6.4.3.4 below.

6.4.3.1 Institutional affiliation cross-tabulated with the level at which academics communicated with colleagues (Questions 19.2 and 19.3)

The cross-tabulation of institutional affiliation and question 19.2 indicated that the UFH respondents (27%) communicated significantly more via e-mail with colleagues on a national basis then their UPE (17%) counterparts. The UPE respondents further indicated a higher usage (32%) of e-mail to communicate with academics within their own institution than the UFH respondents (16%) (cf. Table 6.4.3.1).

Table 6.4.3.1 Communication with colleagues	**19.2 on a national level**	**19.3 at university level**
Institution		
UFH	27%	16%
UPE	17%	32%

6.4.3.2 Age cross-tabulated with the level of the academic communication (Question 19.1)

If the various age categories were cross-tabulated with question 19.1 it can be seen that the age group 41-50 used e-mail significantly more (23%) to communicate with academics on an international level than the other age groups. They were followed by the 51-65 age group (19%) and 31-40 (15%) categories, while the youngest group used this medium the least (8%) (cf. Table 6.4.3.2).

Table 6.4.3.2 Academic communication with colleagues	**19.1 on an international level**
Age	
20-30	8%
31-40	15%
41-50	23%
51-65	19%

6.4.3.3 Gender cross-tabulated with the level of academic communication (Questions 19.1 and 19.2)

When the responses to questions 19.1 and 19.2 were cross-tabulated with gender it was found that significantly more male respondents (21%) used e-mail to communicate with academics on an international level than the female respondents (9%). The male respondents also made more use of e-mail to communicate with academics on a national level (26%) than the female respondents (15 %).

Table 6.4.3.3 Academic communication	19.1 on an international level	19.2 at a national level
Gender		
Female	9%	15%
Male	21%	26%

6.4.3.4 Position cross-tabulated with the level at which the academics communicated with colleagues (Question 19.1)

If the responses to question 19.1 were cross-tabulated with position the following significant differences were found to exist: The professorial level used e-mail by far the most (25%) to communicate on an international level , while the lecturers and senior lecturers indicated a 19% and 14% use of this facility. The junior lecturers (10%) made the least use of e-mail to communicate with academics internationally. (cf. Table 6.4.3.4).

Table 6.4.3.4 Academic communication with colleagues	19.1 on an international level
Position	
Jlect	10%
Lect	19%
Slect	14%
Prof	25%

6.4.4 The use of e-mail to communicate with colleagues on an international level (Questions 20.1.1-20.1.5)

The respondents were further probed to indicate for what purposes they used e-mail to communicate with colleagues on an international level, as well as to rate their level of use of each category on a scale of 0-100.

Table 6.4.4 below indicates that a high percentage of respondents (41%) did not use e-mail to communicate with colleagues on an international level. The most used application of e-mail on an international level was for the exchange of information (30%). The use of this medium for collaboration purposes was far less (18%), and its use for friendship purposes rated only 8% and 'other use' a mere 3%.

Table 6.4.4 Academic communication on an international level for	20.1.1 information exchange	20.1.2 collaboration	20.1.3 friendship	20.1.4 not applicable	20.1.5 other purposes
	30%	18%	8%	41%	3%

The data were further analyzed by cross tabulating the responses to question 20.1.1-20.1.5 with the independent variables. The only statistically significant results were as follows:

		Annova
Age	20.1.2. Academic communication on an international level for collaboration	.032
Gender	20.1.2. Academic communication on an international level for collaboration	.004
Position	20.1.1. Academic communication on an international level for information exchange	.007

These results are discussed in 6.4.4.1, 6.4.4.2, and 6.4.4.3 below.

6.4.4.1 Age cross-tabulated with academic communication on an international level for collaboration (Question 20.1.2)

If the various age categories were cross-tabulated with questions 20.1.2 it can be seen that the middle age categories (31-40 and 41-50) used e-mail significantly more (25% and 24%) for international communication for collaboration purposes than the other two age categories. The oldest age group (51-65) indicated only a 16% use for this purpose and the youngest category (20-30 years) a mere 8% use.

Table 6.4.4.1 Academic communication on an international level for	20.1.2 collaboration
Age	
20-30	8%
31-40	25%
41-50	24%
51-65	16%

6.4.4.2 Gender cross-tabulated with academic communication on an international level for collaboration (Question 20.1.2)

The cross-tabulation of gender and question 20.1.2 indicated that the male respondents used e-mail to collaborate with colleagues on an international level more extensively (23 % use) than their female counterparts (9% use) (cf. Table 6.4.4.2)

Table 6.4.4.2 Academic communication on a international level for	20.1.2 collaboration
Gender	
Female	9%
Male	23%

6.4.4.3 Position cross-tabulated with academic communication on an international level for information exchange (Question 20.1.1)

If the responses to question 20.1.1 were cross-tabulated with position, it was found that the most senior respondents exhibited the most extensive use of e-mail for international exchange of information. The professorial level showed a 45% use of this medium followed by the lecturers (35%) and senior lecturers (30%) , while the junior lecturers used e-mail for this purpose the least (13%).

Table 6.4.4.3 Academic communication on a international level for	20.1.1 exchange of information
Position	
Jlect	13%
Lect	35%
Slect	30%
Prof	45%

6.4.5 The use of e-mail to communicate with colleagues on a national level (Questions 20.2.1-20.2.5)

The respondents were asked to indicate for what purposes they used e-mail to communicate with colleagues on a national level, as well as to rate their level of use of each category on a scale of 0-100.

Table 6.4.5 reflects the respondent's reaction to Questions 20.2.1-20.2.5. The rated response indicated that a fairly high proportion (36%) of respondents did not use this

medium to communicate with colleagues on a national level. The most used application of national communication was for the exchange of information (32%), followed by collaboration (20%), friendship (9%) and then other purposes (3%).

Table 6.4.5 Academic communication on a national level for	20.2.1 information exchange	20.2.2 collaboration	20.2.3 friendship	20.2.4 not applicable	20.2.5 other purposes
	32%	20%	9%	36%	3%

The data were further analysed by cross tabulating the responses with the independent variables. The only statistically significant results were as follows:

		Annova
Gender	20.2.1 Academic communication on a national level for information exchange	.017
Position	20.2.1 Academic communication on a national level for information exchange	.012

These results are discussed in 6.4.5.1 and 6.4.5.2 below

6.4.5.1 Gender cross-tabulated with academic communication on a national level for information exchange (Question 20.2.1)

The cross-tabulation of gender and question 20.2.1 indicated that the male respondents used e-mail to communicate with colleagues on a national level to exchange information more extensively (37%), than their female counterparts (22%). (cf. Table 6.4.5.1).

Table 6.4.5.1 Academic communication on a national level for	20.2.1 information exchange
Gender	
Female	22%
Male	37%

6.4.5.2 Position cross-tabulated with academic communication on a national level for information exchange (Question 20.2.1)

When the responses to question 20.2.1 were cross-tabulated with position it was found that the more senior the level the greater the use of e-mail to exchange information with colleagues on a national level. The professorial level communicated by far the most with a

50% use rating, followed at a far lower use rating of 33% by the senior lecturers and lecturers at 30%. The junior lecturers used this facility for this purpose the least (21%). (cf. Table 6.4.5.2).

Table 6.4.5.2 Academic communication on a national level for	20.2.1 information exchange
Position	
Jlect	21%
Lect	30%
Slect	33%
Prof	50%

6.4.6 The use of e-mail to communicate with colleagues at university level (Questions 20.3.1-20.3.5)

The respondents were asked to indicate for what purposes they used e-mail to communicate with colleagues at university level, as well as to rate their level of use of each category on a scale of 0-100.

Table 6.4.6 indicates that most used application of e-mail to communicate with colleagues at their own universities was to exchange information (37%), a third (33%) did not use e-mail to communicate with colleagues at university level followed by collaboration (14%) friendship (12%) and other applications (4%).

Table 6.4.6 Academic communication within the university for	20.3.1 to exchange information	20.3.2 collaboration	20.3.3 friendship	20.3.4 not applicable	20.3.5 other purposes
	37%	14%	12%	33%	4%

When the data were further analysed by cross-tabulating the responses to question 20.3.1-20.3.5 with the independent variables the only statistically significant results were as follows:

		Annova
Institution	20.3.1 Academic communication within the university to exchange information	.021
Position	20.3.1 Academic communication within the university to exchange information. 20.3.3 Academic communication within the university for friendship.	.037 .032

These results are discussed in 6.4.6.1 and 6.4.6.2.

6.4.6.1 Institutional affiliation cross- tabulated with academic communication within the university to exchange information (Question 20.3.1)

It was clear that the UFH respondents communicated significantly more (45%) than the UPE respondents (29 %) within their own universities to exchange information.

Table 6.4.6.1 Academic communication within the university	20.3.1 to exchange information
Institution	
UFH	45%
UPE	29%

6.4.6.2 Position cross-tabulated with academic communication within the university to exchange information and academic communication within the university for friendship (Questions 20.3.1. and 20.3.3)

It is clear from table 6.4.6.2 below that the professorial category (49%) made by far the most use of e-mail to exchange information in their own university, followed by the lecturer category (42% use rating) and then by the senior lecturers (36%). Junior lecturers used this facility the least at a 21% rating. When the use of e-mail for friendship purposes within their own institutions was considered it was rated most highly by the junior lecturer category (21%) followed by the senior lecturer category (15%). The professorial and lecturer levels indicated a far lower usage of e-mail for friendship purposes (7% and 6% respectively).

Table 6.4.6.2 Academics communication within the university for	20.3.1 exchange information	20.3.3 friendship
Position		
Jlect	21%	21%
Lect	42%	6%
Slect	36%	15%
Prof	49%	7%

6.4.7 E-mail use within a scholarly network (Questions 20.4.1-20.4.5)

The respondents were asked to indicate for what purpose they used e-mail when communicating in a scholarly network, as well as to rate their level of use of each category on a scale of 0-100.

Table 6.4.7 indicates that more than half (55%) of the respondents did not use this medium to communicate in a scholarly network. The most used application of e-mail when communicating within a scholarly network was to exchange information (25%), followed by collaboration (14%), while its use for friendship (4%), and other applications (2%) was negligible.

Table 6.4.7 Academic communication via a scholarly network for	**20.4.1 exchange of information**	**20.4.2 collaboration**	**20.4.3 friendship**	**20.4.4 not applicable**	**20.4.5 other purposes**
	25%	14%	4%	55%	2%

The data were further analysed by cross-tabulating the responses to question 20.4.1.-20.4.5 with the independent variables such as institution, age, gender, position and number of working years. The only statistically significant results were as follows.

		Annova
Institution	20.4.2 Academic communication via a scholarly network for collaboration	.035
Position	20.4.3 Academic communication via a scholarly network for friendship	.033

These results are discussed in 6.4.7.1 and 6.4.7.2 below.

6.4.7.1 Institutional affiliation cross-tabulated with academic communication via a scholarly network for collaboration (Question 20.4.2)

It was clear that the UFH respondents made more use of e-mail (19%) to communicate via a scholarly network for collaboration purposes than the UPE respondents (10 %).

Table 6.4.7.1 Academic communication via a scholarly network	20.4.2 to collaborate
Institution	
UFH	19%
UPE	10%

6.4.7.2 Position cross-tabulated with academic communication via a scholarly network for friendship (Question 20.4.3)

It can be seen from Table 6.4.7.2 that the junior lecturers used e-mail within a scholarly network more (9%) for friendship purposes than the lecturer, senior lecturer and professorial categories (2% for each category). This was a surprising result and it can be queried whether the junior lecturer respondents understood the meaning of a scholarly network.

Table 6.4.7.2 Academic communication via a network for	20.4.3 friendship
Position	
Jlect	9%
Lect	2%
Slect	2%
Prof	2%

6.4.8 E-mail and research (Questions 21-24)

In a series of questions (Questions 21,22,23,24) the respondents were specifically probed about their use of e-mail for research purposes.

6.4.8.1 The role of e-mail in research (Question 21.1-21.7)

The respondents were initially asked to indicate specifically how they use e-mail for research purposes as well as to rate their level of use of each category on a scale of 0-100 (except for 24). Table 6.4.8.1 indicates that the most used application of e-mail for research purposes was for finding information (32%), followed by collaboration with other researchers (22 %). Not all respondents used this medium for research purposes and a 21% not applicable response was obtained. The use of e-mail to transfer files for research purposes (10%), was considerably less (10%) as was its use to communicate with students about research (7%) and their communication with supervisors about their own research. Only 1% indicated other applications.

Table 6.4.8.1 The role of e-mail in research to	21.1 find information	21.2 collaboration	21.3 transfer files	21.4 comm. students about research	21.5 comm. with own supervisor	21.6 not applicable	21.7 other purposes
	32%	22%	10%	7%	7%	21%	1%

The data were further analysed by cross tabulating the responses to questions 21.1-21.7 with the independent variables. The only statistically significant results were as follows:

		Annova
Institution	21.4 Use of e-mail to communicate with students about their research	.014
Age	21.2 Use of e-mail to collaborate with other researchers	.018
Gender	21.3 Use of e-mail to transfer files	.006
Number of Working years	21.3 Use of e-mail to transfer files	.019

These results are discussed in 6.4.8.1.1, 6.4.8.1.2, and 6.4.8.1.3

6.4.8.1.1 Institution cross-tabulated with use of e-mail to communicate with students about their research (Question 21.4)

It was clear that the UPE respondents communicated significantly more with their students about their research than the UFH respondents (10 % vs 4%) (cf. Table 6.4.8.1.1)

Table 6.4.8.1.1 The role of e-mail in research to	21.4 communicate with students about their research
Institution	
UFH	4%
UPE	10%

6.4.8.1.2 Age cross-tabulated with the use of e-mail to collaborate with other researchers (Question 21. 2)

If the various age categories were cross-tabulated with questions 21.2 it can be seen that the middle age groups (31-41 and 40-50) used e-mail to collaborate with other researchers more frequently (27% and 28% respectively) than the youngest respondents (20-30 years) who

rated their e-mail use for this purpose at 18%, while the oldest respondents rated e-mail for this purpose the least (13%).

Table 6.4.8.1.2 The role of e-mail in research	21.2. to collaborate with other researchers
Age	
20-30	18%
31-40	27%
41-50	28%
51-65	13%

6.4.8.1.3 Gender cross-tabulated with use of e-mail to transfer files (Questions 21.3)

If the responses to question 21.3 were cross-tabulated with gender it was found that the male respondents used e-mail to transfer files more frequently (10% usage) than their female counterparts (5% usage) (cf. Table 6.4.8.1.3).

Table 6.4.8.1.3. The role of e-mail in research to	21.3. transfer files
Gender	
Female	5%
Male	10%

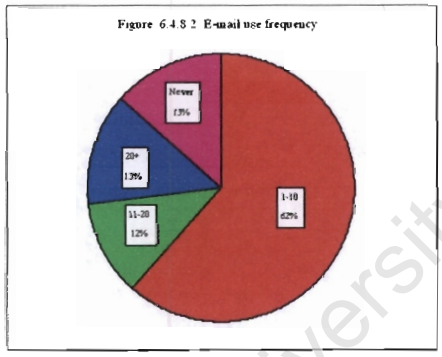
6.4.8.1.4 Number of working years cross-tabulated with use of e-mail to communicate with students about their research (Question 21.4)

If the responses to question 21.4 were cross-tabulated with the number of working years at an institution, it can be seen that the respondents with a longer length of service tended to use e-mail slightly more extensively to communicate with students about their research than those working a shorter service period, viz.: The respondents with the most number of working years (11+) indicated a 15% use of e-mail for communication with students about research followed by the 6-10 years category with 9%, and those with the least number of working years (0-5 years) with 7% (cf. Table 6.4.8.1.4).

Table 6.4.8.1.4 The role of e-mail in research	21.4 to communicate with students about research
Number of working years	
0-5 years	7%
6-10	9%
11+	15%

6.4.8.2 The frequency of e-mail use for research purposes (Question 22)

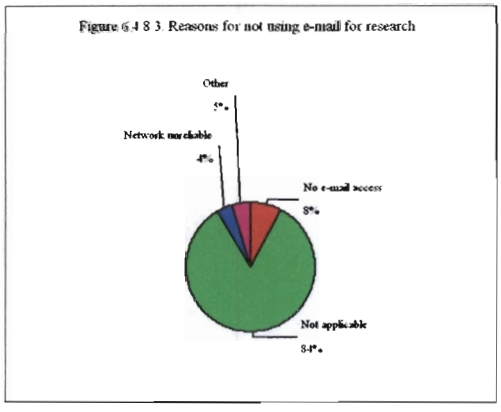
Figure 6.4.8.2 below depicts how frequently the respondents used e-mail for research purposes. The majority of the respondents (62%) used e-mail 1-10 times a week for research. The remainder of the responses were fairly equally distributed amongst a use of 11-20 times a week (12%) more than 20 times a week (13%) and never (13%). The latter response was at variance with that obtained in 6.4.9 where 21 % indicated non-use of this medium for research purposes.



If the data were further analysed and cross-tabulated according to the independent variables the Pearson chi-square statistic shows no significant result.

6.4.8.3 Reasons for not using e-mail for research (Question 23)

Table 6.4.8.3 below reflects the respondents' reasons for not using e-mail for research. The vast majority do use it for research (84%). Of the few who did not use it for research 8% indicated that they did not have access to e-mail, while 4% found the network unreliable and 5% completed the other category response.



If the data were further analysed and cross-tabulated with the independent variables only age showed significance if the Pearson chi-square test was calculated.

6.4.8.3.1 Age cross-tabulated with reasons for not using e-mail for research (Question 23)

Not having e-mail access as reason for not using it for research obtained the highest response from the 20-30 years age group (12%), followed by the age category 51-65 (10%) and 31-40 age group (8%). The younger age group was the only group who indicated that the network was unreliable (15%). The oldest category indicated the highest 'other' response reason for not using e-mail for research (14%). The middle age categories (31-50 years) were the group that mostly used e-mail for research (92% use to 94% use), while the oldest 51-65 years made slightly less use of this medium for research (76%) and the youngest group (20-30 years) the least (69%) (cf. Table 6.4.8.3.1).

Table 6.4.8.3.1 Reasons for not using e-mail for research	23.1 No e-mail access	23.2 Network unreliable	23.3 Not applicable	23.4 Other
Age				
20-30	12%	15%	69%	4%
31-40	8%	0%	92%	0%
41-50	3%	0%	94%	3%
51-65	10%	0	76%	14%

6.4.8.4 Further aspects relating to the use of e-mail in research (Question 24)

Although in certain aspects similar to question 21, question 24 addressed the role of e-mail in research by comparing its use in addressing information needs and enhancing communication with colleagues with various research output factors.

Table 6.4.8.4 depicts these responses in ranked order. As in question 21, it can be seen that the greatest use of e-mail in research was to address information needs (74%) followed by enhancing their (73%) communication with colleagues. A considerable number of respondents indicated that it assisted them to increase their research output with reference to writing articles (65%), co-authorship (54%) and producing conference papers (51%). In all instances the majority of respondents indicated a positive usage ranging from 74% positive response for enhancing communication with colleagues to a 51% positive response regarding the increase in conference paper output.

Table 6.4.8.4 Usefulness of e-mail to :-	Yes %	No %
24.1 Enhance communication with colleagues	73%	27%
24.2 Address information needs	74%	26%
24.3 Increase article output	65%	35%
24.4 Increase co-authorship	54%	46%
24.5 Increase conf. paper output	51%	49%

The data were further analysed by cross-tabulating the responses with the independent variables. The only statistically significant results were as follows.

		Annova
Gender	24.2 Addresses information needs	.046
Gender	24.4. Increases co-authorship	.008
Gender	24.5 Increases conf. paper output	.002

These results are discussed in Table 6.4.8.4.1

Table 6.4.8.4.1 Usefulness of e-mail to:-			
	24.2 Address information needs		
Gender	Yes	No	Total %
Female	41%	59%	100
Male	20%	80%	100
	24.3 Increase co-authorship		
Gender			
Female	65%	35%	100
Male	37%	63%	100
	24.5 Increase conf. paper output		
Gender			
Female	71%	29%	100
Male	39%	61%	100

From Table 6.4.8.4.1 it can be seen that the female respondents were far more positive than their male counterparts about the use of e-mail in addressing information needs (41% vs. 20%), increasing co-authorship (63% vs. 7%) and increasing conference paper output (71 % vs. 39%).

6.5 Conclusion

A critical analysis and the summary for this chapter will be provided in chapter 7.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

E-mail has become an essential application for digital communication in the academic work milieu. It eases research and communication not only within a specific institution but also among all researchers in the global scientific and academic world. The question, however, raised in Chapter 1 was whether academics in the Eastern Cape, one of the least developed provinces in South Africa, are utilising computer mediated communication (CMC) to its full capacity in their academic work. The researcher was further motivated to investigate the status, use and application of CMC at two institutions, the University of Fort Hare within the Historical Disadvantage Institution (HDI) category, and the University of Port Elizabeth, within the Historically Advantage Institutions (HAI) category. The intention was to see if an inherent backlog within HDI's impacted negatively on CMC use. The study also considered other factors that emerged from the literature survey that could impact on CMC use such as age, position, gender and number of working years of the academic population.

The researcher first investigated the status, capacity and support for CMC at the two institutions. The study then proceeded to determine the use of CMC for academic purposes. This was related to the CMC competence of the academic staff, technical knowledge and frequency of use of e-mail, familiarity with the various applications and whether and for what purposes academics made use of CMC in their academic work environment.

To meet these objectives the study was guided by the following research questions (cf. chapter 1, 1.3.):

1. What is the perceived status of CMC at the two institutions?
2. What is the competency level of academic staff with specific reference to utilising CMC applications in their specific environment?
3. To what extent and for what purposes do academics use CMC, specifically e-mail, in their academic work environment?
4. Are there any differences between the two institutions with regard to CMC use?

This chapter will summarise the findings obtained from the empirical study, draw conclusions and in the process examine whether the research objectives have been met, discover to what extent the research questions have been answered, and make appropriate recommendations. To facilitate the drawing of conclusions a summary of the main findings will first be presented.

7.2 Summary of the main findings

In this section the main findings obtained from the data analysis for the overall study population will be outlined.

7.2.1 Demographic Profile (cf.6.2.1-6.2.4; Q 1-4).

The demographic profile focused on age, gender, and position as well as number of working years of the respondents. The age distribution for the total sample was fairly even with marginally more respondents in the 41-50 years age category and slightly fewer in the 51-65 age category. If the age distribution was considered according to institutional affiliation significant differences occur and it can be seen that a far younger contingent of respondents worked at UPE than at UFH.

The gender distribution of the respondents reflected a two to one ratio, with two males for every female. This gender discrepancy in the sample is a reflection of the skewed gender tenure that generally pertains at the two institutions. If the gender distribution was compared for the two institutions it can be seen that the gender difference was particularly skewed at UFH, where only 24% of the respondents were female as compared to the more equitable 41% female contingent at UPE.

The position categorisation showed a fairly even distribution amongst the junior lecturers, lecturers and senior lecturers, with only the professorial category containing a smaller though still comparable stratum. This categorisation was not much different when comparing the two institutions. This outcome is not unexpected as in designing the stratified sample the researcher endeavoured to achieve this result.

With regard to the number of working years it can be seen that the majority of respondents had worked for less than ten years. This general trend was even more marked amongst the

UPE respondents where 52% had worked for less than five years in contrast to the 36% at UPE. A further indication of greater staff renewal at UPE is the far larger proportion of staff with working years in excess of 10 years at UFH (42%) than at UPE (20%).

7.2.2 Status of CMC and e-mail use (cf. 6.3.1–6.3.4; Q 5–8)

The purpose of this section was to ascertain the status of CMC and e-mail use at the two institutions. The aim was also to establish the perceived capacity of e-mail at the two institutions and the academic staff's ability to use this medium.

A high number of respondents (77%) have access to a personal computer in their own office. Almost all the respondents (97%) indicated that they were familiar with e-mail and the vast majority (94%) indicated that they had access to e-mail. On examining the environment of e-mail access it was found that a substantive proportion (49%) of the respondents indicated that they had access to e-mail both at home and at work, while 40% only had access at work.

Cohen (online:1995) contended that a link exists between access to equipment such as a personal computer and the possibility of using CMC, and that those with no 'appropriate access to equipment' are least likely to use CMC. Respondents who thus had the greatest connectivity (i.e. at work and at home) are the most likely users of CMC applications such as e-mail. This assertion would appear to be true for the respondents and it is abundantly clear that both the CMC capacity and access was at a high level. It was clear that utilisation of e-mail in the work environment was a fairly recent phenomenon with 44% of the respondents having used it for less than 5 years and 84% for less than 10 years. This was not a surprising outcome considering the relative recency of the introduction of e-mail in the academic environment. It was once again not surprising that the most used e-mail systems was Microsoft Outlook either used alone (38%) or in combination with Pegasus (30%). Microsoft Outlook has a significant market edge in the e-mail environment in general and while Pegasus was the system previously used by both academic institutions, it has virtually been phased out by both UPE and UFH in favour of Microsoft Outlook.

A surprising outcome in view of the high indication of familiarity with e-mail and the significant proportion of respondents who rated their competency in using e-mail as good

(53%), was that only 29% of the respondents had received any e-mail training, of which 7% was at a basic and 23% at an advanced level.

The respondents were generally not very satisfied with the technical attributes of the networks that host the e-mail systems at their institutions. Only 18% of the respondents were satisfied with the stability of the e-mail network and only 20% rated the Information Technology Support (ITS) at the respective institutions as good. They, however, were generally satisfied with the functionality of the actual e-mail systems they interacted with the largest proportion (47%) rating it good.

7.2.3 The application of e-mail for communication purposes (cf. 6.4.1-6.4.8; Q 17-20)

The purpose of this series of questions was to ascertain for what purposes the respondents mainly used e-mail in their academic work environment. They were first asked to indicate and rate their use of e-mail at a general level and then this was further drilled down to specific uses of e-mail for communication purposes.

The use of e-mail for routine work was by far (40%) the most used general application. This was followed by private conversation (21%) and professional communication with colleagues (19%). Very few respondents used e-mail to communicate with their students (9%). As mentioned above the respondents were next asked to consider specific aspects and attributes that related to their use of e-mail for professional communication with their students and colleagues.

A surprising outcome was that 50% of the respondents indicated that they never used e-mail to communicate with their students. Those respondents who did use it for this purpose mostly used it to communicate routine, administration matters to their students (23%), followed by communication for research purposes (15%), teaching purposes (10%) and other reasons (2%). Once again it is clear that e-mail was used mainly for utilitarian purposes rather than more academic activities.

The respondents were next asked to rate their use of e-mail for communication with colleagues within their university, within the country, internationally and in a scholarly communication network. The substantial majority who did use this medium for this purpose

(73%) mostly communicated with colleagues within their own university (24%) and at a national level (22%). They communicated less frequently at an international level (17%) and within a scholarly network (10%).

The respondents were further probed to establish the main reasons for using e-mail at each of the levels of communication indicated above, i.e. the ratio in which it was used for information exchange, collaboration, friendship or other purposes within their own institutions, South Africa, internationally and within a scholarly network. A clear pattern emerged and it was evident that in all instances by far the most used application was to exchange information (range of 50% - 56%), followed by collaboration (range of 21% - 31%). The use for friendship was rated much lower (range of 9% - 18%) and 'other purposes' even more so (range of 4% - 6%). It is further clear that the aggregated ratings for each use at the various levels were very similar.

7.2.4 The role of e-mail in research (cf. 6.4.8-6.4.12; Q 21-24)

The final series of questions specifically addressed the role of e-mail in research and a high use of e-mail for research purposes was reported (79%). The most used application of e-mail for research purposes was for finding information (32%) and then for collaboration with other researchers (22%). This was followed by the transfer of files (10%), communication with students about research (7%), communication with their supervisors about their own research (7%), other applications (1%) and 'not applicable (21%). The high ratings for the use of e-mail to find information and to collaborate in research correlates with the findings reported in the previous sections.

The intensity of use of e-mail for research purposes was moderate with almost two thirds of the respondents (62%) using e-mail 1-10 times a week for research and only 25% using it more frequently. Of the few respondents (16%) who did not use e-mail for research, half indicated that they either had no access to e-mail (4%), or that the network was unreliable (4%) and the other half (8%) indicated 'other' non-specified reasons.

The final question tested, by means of a Likert-type scale, more specific aspects related to the use and application of e-mail in the research environment. The highest scores were obtained for its use to address information needs for research (74%), followed closely by the

enhancement of communication with colleagues (73%). Its use to increase research output was further also indicated by scores of 65% for increasing article output, 54% for enhancing co-authorship and 51% for increasing conference paper output.

7.3 Examination of the effects of the independent variables

The results outlined above were further analysed by cross tabulating them with the independent variables (i.e. institutional affiliation, age, position, number of working years and gender) and subjected to the Chi-square significance test. The effect of variation of the independent variables on the status of CMC and e-mail use and the application and use of e-mail for communication and research purposes will be outlined for each significant cross-tabulation (i.e. those that obtained a significant chi-square statistic at p levels $\leq .05$). The significant results for each independent variable will be grouped together.

7.3.1 The impact of institutional affiliation

- **Institutional affiliation and the status of CMC and e-mail use (cf. 6.3.4-6.3.10; Q 5-14)**

With reference to the environment of e-mail access a clear trend emerged in that more UPE than UFH respondents were connected to e-mail (100% vs 86%) and more of them also had access to e-mail both at home and work (63% vs 34%). More UFH than UPE academics, in turn, had access only at work (46% vs 35%), or only at home (6% vs 0%). Cohen (1996: 49) noted that academics "who had access to equipment and connectivity both at home and in their offices were the most likely to use CMC".

On examining the type of e-mail system that the academics from the two institutions mostly used, it became evident that more UFH respondents used a combination of e-mail systems (Microsoft Outlook and Pegasus) (40% vs 20%), or were uncertain what they use (14% vs 4%) than their UPE counterparts who in turn made greater use of either only Pegasus (28% vs 6%) or the Microsoft Outlook (44% vs 30%) e-mail systems. These results could be a reflection of the fact that at the time of the survey both institutions were in a state of flux regarding e-mail systems used as they were in the process of migrating from the Pegasus mail to Microsoft outlook e-mail system.

Training in the use of e-mail among respondents from both institutions appeared to have been inadequate. Having observed this, it is however clear that more UFH academics received training (36%) than their UPE (22%) colleagues. The respondents, in general, were not very positive about the information technology support they receive at their institutions, but it is also clear that the UPE respondents rated their Information Technology Support (ITS) support much higher than their UFH counterparts (35% vs 4%).

- **Institutional affiliation and the use of e-mail for research and communication purposes (cf. 6.4.1-6.4.4; Q 17-24)**

Respondents were asked to give a rating of their use of e-mail to communicate with their students, and although a low use for this purpose was generally returned, the UPE (14%) academics did use this medium more extensively than the UFH academics (4%). The main reason why they used e-mail to communicate with their students was for routine purposes and once again the UPE respondents (31%) engaged in this more heavily than their UFH (13%) counterparts.

The respondents were likewise asked to rate their use of e-mail to communicate with colleagues in general and in this instance the UFH respondents (24%) used e-mail more that their UPE counterparts(15%) for this purpose. On investigating the level at which e-mail was used to communicate with colleagues – i.e. own university, national, international, or scholarly network level - more UFH (27%) respondents used e-mail to contact colleagues on a national level, in comparison with the UPE respondents (17%), while the UPE (32%) academics made heavier use of e-mail to communicate with colleagues at their own university level than their UFH (16%) counterparts.

On being asked to indicate for what purpose they used e-mail at each of the four levels listed, it was found that in general the heaviest use was to exchange information and UFH respondents used e-mail much more to exchange information (45%) within their own university than their UPE counterparts (29%). A surprising outcome was that the UFH respondents (19%) indicated greater use of e-mail to communicate via a scholarly network for collaboration purposes than the UPE (10%) respondents.

The respondents were further queried on the use of e-mail for research and the specific use made under these circumstances. While it was not frequently used to interact with students

for research purposes, it was observed that the UPE respondents use e-mail significantly more to communicate with their students about research aspects than the UFH respondents (10% vs 4%).

7.3.2 The impact of age

- **Age and the status of CMC and e-mail use (cf. 6.3.1-6.3.12; Q 5 -16)**

It should be noted that for ease of reporting age response categories were collapsed where they showed similar responses in this section. This is in accordance with recommendations made by Babbie (1995:382-383)

The cross-tabulations indicated an interesting and distinctive correlation between the age of the respondents and access to a computer. With increase in age there was a greater tendency to have access to a computer, as indicated by the 50% access within the 20-30 age category that grew to 76% for the 31-40 age category and 91% access for the 41-65 age category.

Clear differences were also observed among the various age groups and the type of e-mail system that they used. The youngest age group (20-30 years) were by far the heaviest users of Microsoft Outlook only (50%) followed to a lesser extent by Pegasus only (27%). The middle age categories (31-50 years) indicated that they used a greater variety of systems in almost equal proportions, viz.: a combination of systems (35%), Microsoft Outlook only (30%), Pegasus only (18%). The oldest age category (51-65 years), in turn, used Microsoft Outlook and a combination of systems in almost equal proportions (43% and 38% respectively). In summary it would thus appear that the younger respondents were more inclined to using Microsoft Outlook only, while the middle-age groups used a variety of systems, and the older group concentrated on either Microsoft Outlook or a combination approach.

- **Age and the use of e-mail for research and communication purposes (cf. 6.4.1-6.4.11; Q 17-24)**

A distinctive outcome of the cross-tabulation tabulation between age and the communication purpose of e-mail use was that the younger the respondents the more they utilised e-mail for private conversation purposes – use decreased from 33% for the 20-30-years category to 20% for the 31-50 years category to a mere 10% for the 51-65 years category. Chu (1994:80)

indicated that "It is generally believed that people of a younger generation are more open than those of the older generation to new technologies such as e-mail". This could explain why the younger generation took to this medium more readily for private communication then their older colleagues. (cf. 6.4.1.2; Q.17.2).

The only significant results for the cross-tabulation tabulation between age and the levels of communication was for communication at an international level. The use of e-mail for international communication was generally at a low level, but it can be seen that the older age categories (41-65) used e-mail significantly more (21% use) to communicate with colleagues on an international level than the middle age category (31-40 years) at 15% use and the youngest category (20-30 years) at 8% use. This is not unexpected as one can assume that the older academics are usually well-established researchers and have over the years built a network of expertise with colleagues on an international level.

Respondents were further probed to indicate for what purposes they used e-mail on an international level. From the results it was clear that the middle age groups (31-40 and 41-50 years) used e-mail significantly more for collaboration purposes (25%) than the oldest and youngest age categories 51-65 years gave a rating of 16% and the 20-30 years a rating of 8%. Perhaps one can explain this phenomenon with the observation that the middle age categories are the upcoming researchers and need to collaborate more with international colleagues to build a repertoire of contacts.

The application of e-mail for research purposes showed a significant relation between its specific use for collaboration and variation in age. The middle age groups (31-50) showed the highest frequency level for using e-mail for collaboration with other researchers (28%), followed by the younger respondents (20-30 years) who returned a 18% frequency response, and the oldest respondents with the lowest frequency response of 13%.

Although most of the respondents did use e-mail for research purposes, a few respondents did not apply it for this purpose. Their responses varied significantly when their reasons for non-use were cross-tabulation tabulated with age. The youngest (20-30 years) and oldest age (51-65 years) categories gave the highest 'not used for research' returns (31% and 24% respectively vs 7% for the 31-50 age category) and 'not having access to e-mail' as a reason

(12% and 10% respectively vs 7% for the 31-50 age category), and the youngest age group (20-30 years) was the only category that indicated 'an unreliable network' as reason (15%).

7.3.3 The impact of position

- **Position and the status of CMC and e-mail use (cf. 6.3.1-6.3.12; Q 5-16)**

When the effect of position on environment of e-mail access was considered it was found that the more senior categories (senior lecturers and professorial group) were more inclined to have access both at home and at work (66% and 55% respectively) than the more junior categories (junior lecturers (46%) and lecturers (32%). The junior categories, in turn, were more predisposed to access at work only (junior lectures, 54% and lecturers, 48%) than the more senior categories (senior lecturers, 28% and professorial group, 30%). An interesting observation is that all of the junior lecturers indicated that they had access to e-mail, the only category to do so and many with no personal computer in their office. The category that gave the highest return for not having access to e-mail was the lecturers (16%), followed by the senior lecturers (7%) and professorial group (5%). A surprising outcome was that 10% of the professorial category indicated that they had access only at home. The only other category that also indicated having e-mail access only at home were the lecturers at 4%.

Satisfaction with the functionality of the e-mail systems increased with the more senior the position of the respondents, e.g. 60% of the combined professorial/senior lecturer category were satisfied in contrast to the lecturers and junior lecturers satisfaction rating of 32% and 42% respectively.

- **Position and the use of e-mail for research and communication purposes (cf. 6.4.1-6.4.11; Q 17-24)**

When the reasons for using e-mail for communication purposes was cross-tabulation tabulated with position it was found that the junior lecturers made by far the most use of e-mail for private conversation purposes (38 %) than the more senior positions (lecturers, senior and professorial categories) 18%, 17% and 14% respectively. If one assumes that the junior lecturers are also younger than their more senior counterparts, this response could be ascribed to the younger members being more adaptable to using the new medium as a social communication tool as mentioned above.

When the level of e-mail communication with colleagues was compared with the position categories significant differences were observed for communication at an international level. The professorial category made the most use of e-mail to communicate with colleagues internationally (25%), followed surprisingly by the lecturers (19%), and not the senior lecturers (14%), while the junior lecturers returned a use rate of 10%. On probing the reason for using e-mail to communicate at an international level it was found that more respondents at the professorial level used it for the exchange of information (45%) than did the lecturers (35%), senior lecturers (30%) and junior lecturers (13%).

A similar pattern emerged when the purpose of e-mail use on a national level was considered. The professorial category used e-mail for the exchange of information on a national level significantly more (50%) than the senior lecturers (33%), lecturers (30%) and the junior lecturers (21%) did.

If the purpose of communication within their own institution was examined it can be seen that the professorial and lecturer categories made by far the most use of e-mail to exchange information (49% and 42%), than the senior (36%) and junior lecturer (21%) categories did.

The only instances where the junior lecturers showed higher ratings than their more senior counterparts were for the use of e-mail for friendship purposes when communicating with colleagues in their own universities and within a scholarly network. In the former instance the use of e-mail for friendship purposes dropped from a 21% rating by the junior lecturer category to 15% by the senior lecturer category to 7% by the professorial levels and 6% by the lecturer category.

The relatively greater indication of use of a scholarly communication network for friendship purposes by the junior lecturers (9% use versus 2% by all other position categories) was unexpected and it can be asked whether the junior lectures understood the meaning of a scholarly network.

7.3.4 The impact of number of working years

- **Number of working years and the use of e-mail for research and communication purposes (6.4.1-6.4.11; Q 17-24)**

The 'number of working years', when cross-tabulation tabulated with the status of information technology and e-mail use questions (Section B) did not produce significant chi-squared results. However, when cross-tabulation tabulated with the application and use of e-mail questions (Section C) the following emerged:-With regard to the use of e-mail for private conversation it can be seen that the academics with the least number of working years made the most use of e-mail for private conversation, while the respondents with the most number of working years (6-10 years and 11+ years) made the least use of this facility (13% and 9% respectively). One would once again assume that those with the least number of working years are the younger respondents who are generally, as mentioned in the previous sections, more open to the use of e-mail for social reasons.

On examining the number of working years in relation to the use of e-mail to communicate with students about research it can be seen that the respondents with a longer term of service used e-mail more to communicate with students for research purposes than those working a shorter period. The use for this purpose decreased from a 15% use for respondents with 11+ working years to 9% and 7% for 6-10 years and 0-5 years working experience.

7.3.5 The impact of gender

- **Gender and the status of CMC and e-mail use (cf. 6.3.1-6.3.12; Q 5 -16).**

The only instance where gender had an impact on the status of CMC and e-mail use was on the access to personal computers. The results clearly indicate that considerably more male (83%) respondents had access to personal computers in their offices than their female (65%) counterparts.

- **Gender and the use of e-mail for research and communication purposes (cf. 6.4.1-6.4.11 Q 17-24)**

It is clear that the male respondents were more inclined to use e-mail to communicate with their colleagues (22%) than their female counterparts (13%) and they also used e-mail for

communication with colleagues on both an international and national level more extensively (21% and 26% respectively) than their female colleagues (9% and 15% respectively).

On examining the reasons for communication on an international level it can be seen that the male respondents used e-mail more extensively for collaboration purposes (23%) than the female respondents (9%). The males also made greater use of e-mail to exchange information at a national level (37%) in comparison to their female counterparts (22%)
When considering gender and the use of e-mail to transfer files for research purposes, it was found that e-mail was used more frequently by the male respondents (10% usage) than their female counterparts (5% usage). The reverse was, however, observed when further specific applications of e-mail in research (Q 24) were considered. The responses here indicated that the female respondents were surprisingly more positive than the males about the use of e-mail in addressing information needs for research purposes (41% vs 20%), as well in its use to increase co-authorship (63% vs 7%) and its use to increase conference paper output (71% vs 39%).

7.3.6 Summary of the significant results relating to the effects of the independent variables

Institutional affiliation

In summary it can be stated that the UFH respondents in relation to their UPE counterparts generally

- had greater e-mail access either only at home, or only at work, or not at all
- were more inclined to use a combination of e-mail systems or none at all
- received more training in e-mail use and application
- were less satisfied with their IT support

While the UPE respondents

- generally had greater e-mail access both at home and at work
- were more inclined to use either Microsoft Outlook only, or Pegasus only
- received less training in e-mail use and application
- were more positive about their IT support

Age

- older respondents were more prone to own a personal computer

- the older age categories used e-mail mostly to communicate on an international level more than the other age groups
- the middle age groups utilised e-mail more frequently to collaborate with other researchers
- the younger academics mostly used Microsoft Outlook e-mail system and use e-mail for private conversation purposes, more so than the older respondents

Position

- there was a tendency for the senior and professorial categories to have e-mail access both at home and work. They where also more positive about the functionality of the e-mail system they were using than the other categories
- professors used e-mail far more than any other position category
- the professors showed a far greater use of e-mail on an international, national and own university level than the other categories. They also communicate with colleagues on an international level more than the other categories
- the junior lecturers were the only position category that made significant use of e-mail for private conversation purposes

Number of working years

- the respondents with the least number of working years made by far the most use of e-mail for private conversation purposes
- the more years that the respondents had worked the more they tended to use e-mail to communication with their students about their research

Gender

- far more male respondents had access to a personal computer than their female counterparts

- male respondents used e-mail more to communicate with colleagues on an international and national level than female respondents
- the male respondents exhibited a greater use of e-mail than their female colleagues to collaborate with colleagues on an international level; to exchange information with colleagues on a national level; and to transfer files for research purposes
- however, when further specific e-mail applications in research were addressed a reversal of roles takes place and the female respondents indicated a far greater use of e-mail to address information needs, for co-authorship and conference paper presentation purposes. This anomaly in response is inexplicable to the researcher

7.4 The main conclusions in relation to the research questions

To conclude the study the researcher will examine to what extent the research questions that guided the investigation were answered. As mentioned HDI's had experienced inherent backlogs, and it was assumed that these would have had a negative impact on their CMC facilities. The researcher surmised that in the absence of the necessary infrastructure, the academics in the HDI environment would not use CMC to its fullest capacity. The problem that was identified relates to the pertinent role that CMC, and more specifically e-mail, can play in communication within the academic environment. The study further attempted to establish whether the academics from a HAI and a HDI manifested inherently different approaches towards e-mail use within their work environment.

The basic premise that motivated the research project was that HDI's are ill-equipped as far as their CMC infrastructure and capacity is concerned, and this deficiency would thus impact negatively on their teaching and research activities.

CMC experienced a radical transformation during the last couple of years. Not only in terms of the proliferation of Information Technology Communication (ITC), but also with regard to the applications thereof. Amongst others, the opportunities that CMC offered opened new avenues and brought about considerable changes in communication patterns and information-seeking behaviour. These possibilities have had a beneficial impact on scholarly community, and it is unthinkable to picture research without e-mail.

Of significance is the role of CMC at institutions of higher learning, not only in terms of research, but also in terms of teaching and general communication. In the current competitive environment where various institutions compete with one another in terms of research output, attracting more students, and subsidy allocation, a sound IT infrastructure and active CMC use has become an essential part of the learning environment.

The distinction between HAI's and HDI's in relation to the socio-political developments in South Africa is well known. This has translated into structural and systemic distinctions, endemic to the respective institutions. In view of these developments, as well as the researchers' observations regarding the HDI context, the study investigated the role of CMC at a HDI and HAI respectively. More specifically, the study focused on the role of e-mail.

The study has, however, clearly indicated that although the CMC infrastructure and capacity at both institutions were well established, there were significant differences between the two institutions with regard to the role of e-mail in each work environment. In the following sections the results will be discussed in relation to the research questions.

7.4.1 The status of CMC at the two institutions

It came as a surprise that the e-mail access of respondents did not differ radically between the UPE and the UFH. Age and gender had more of an impact in that the older respondents and the male respondents were more prone to having a computer both at home and work, than any other category. It was noticeable that in the study of Bridges and Clement (1997:111) on e-mail use at the University of Tennessee (UTK) and Brigham Young University (BYU) in the United States, indicated that the location of e-mail use could have an important impact on the amount of time spent using e-mail for research purposes.

7.4.2 The competency level of academic staff with specific reference to utilising e-mail

The academics seemed generally to be well acquainted with the e-mail system that they were using, and training in e-mail use did thus not feature highly among the respondents from either university. However, more UFH respondents attended training sessions than their UPE colleagues. The respondents at both institutions expressed their dissatisfaction with regard to ITS support, and the UFH respondents were considerably more dissatisfied than the UPE

respondents. There was a higher incidence of academics that used a combination of e-mail systems at the UFH, while a preference for the Microsoft Outlook e-mail system was indicated at both institutions.

7.4.3 The purpose and use of CMC specifically in the work environment

Significant distinctions with regard to the specific use of e-mail and its applications emerged. Generally speaking, e-mail was used for routine purposes, but at the UPE, e-mail was used significantly more to communicate with students. At the UFH e-mail was used more to communicate with colleagues, than at the UPE.

That e-mail was regarded as a valuable tool for research purposes, was clear. It was used extensively to communicate with colleagues at institutional-, national,-, and international level and less so at the scholarly network-level. The main purpose for this interaction in all instances was to exchange information. At the UFH the use of e-mail for communication with colleagues at the institutional and national level was significantly higher than at the UPE. At the UFH, there was a stronger indication of institutional communication as well as 'networking' for research purposes than at the UPE. Throughout this study it became evident that male respondents seem to be more prominent users of e-mail and its applications than their female counterparts.

7.4.4 The differences between the two institutions with regard to CMC use

The last research question addressed the differences between the two institutions with regard to CMC use. The original premise of this study was that HDI' were making less use of use e-mail than HAI' and that there would be a positive correlation between the competence (training) and use of e-mail and its applications. From the results obtained above it is clear that in certain instances the opposite was revealed and in others not, viz.:

- The UPE respondents (i.e. a HAI institution) were more positive with regard to e-mail use and applications as far as:-

    - Being better connected to e-mail than their UFH respondents.

- Accessing e-mail from both their home and office.
- Communicating with their students more for routine purposes than their UFH (13%) counterparts.
- The information technology support they received.
- Communicating with academics within their own institution and for information exchange purposes.
- Communication with students about research related aspects

- The UFH respondents (i.e. a HDI institution) in turn were more positive with regard to e-mail use and applications as far as :-

  - Accessing their e-mail from their offices only.
  - Using a combination of e-mail systems (Pegasus and Microsoft Outlook).
  - Receiving more training than their UPE counterparts.
  - Communication with colleagues in general and contact with colleagues on a national level.
  - Exchanging information within their own university.
  - Communication via a scholarly network for collaboration purposes.

This research was descriptive and explanatory in nature and opened issues for future research and clarification.

Information technology innovations are changing rapidly. Where this study focused on the role of e-mail in the research environment at the two institutions in question, a more detailed analysis could shed light on e-mail and IT with respect to specific disciplines. The Internet is becoming more and more important to various disciplines due to its capability for incorporating various kinds of media formats. Future research might concentrate on Internet searching behaviour at different stages in the research process.

Further research is needed in order to understand why female respondents exhibit less use and access to almost all the e-mail facilities and equipment at their respective institutions identified in this study. From this study it also became clear that e-mail is not being used to contact students especially in the HDI environment and the reasons for this should be

investigated. The study further revealed that UFH respondents do not have the same e-mail access at their homes as their UPE counterparts and this also leaves room for further investigation.

Within the competitive context that characterises higher education in South Africa today, the role of e–mail with regard to research cannot be underestimated. The establishment of a communication-network between researchers and /or scientists not only results in an increase in the number of people communicating with one another (peer recognition), but there also seems to be a correlation between the frequent use of information technology and increase in productivity and research output (Hesse et al, 1993:90-101). There was, however, a definitive difference between the UPE and the UFH in regard to research output. The paucity of research output at the UFH despite the availability of adequate e-mail facilities (CMC), warrants a further investigation, i.e. to establish the various factors that contribute towards this disparity.

7.5 Conclusion

It was clear, also from this study, that e-mail contributes towards research and communication not only within the institution but also facilitates communication with all participants in the so-called 'global village'. This study contributed towards the clarification of the use of CMC by academics at two sites in the Eastern Cape and assisted the researcher in determining to what extent e-mail was utilised to its full capacity in the academic work of the Universities of Fort Hare and Port Elizabeth. It further contributed towards the conceptualization of the level of disparity, if any, between the two institutions, with regard to IT infrastructure and the role of e-mail within the research environment.

This study has enabled the researcher to clarify many aspects regarding the use of e-mail in the communication process, particularly as far as its use in academic work in general and more specifically research. It has further contributed to obtaining a better understanding of the application of CMC at a HDI in comparison to a HAI.

In conclusion it should be stated that this study merely examined two institutions within a very specific area in South Africa and at a specific point in time. It is suggested that further

research should be conducted where a wider range of universities should be studied to establish the impact and use of CMC on academic endeavour and the possible impact that past inequalities caused by the previous political dispensation could have had on the use of CMC in the university environment.

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Appendix 1

Dear academic

The Management / Research Department at your University has granted me access and permission to collect information for study purposes. This information will be collected through a questionnaire; however, your participation in this research project is absolutely voluntary.

The questionnaire, takes about 15 minutes to complete, and forms part of a M. Bibl (Master in Library and Information Science) degree at the University of Cape Town. The study investigates the role and function of e-mail as a form of computer mediated communication for research purposes at the universities of Fort Hare and Port Elizabeth. It is anticipated that through this study the role/place of e-mail be clarified as an important aspect of the research environment.

Your responses will be treated with strict confidentiality. (Ms. M van der Merwe will assist me in handing out the questionnaire, as well as collecting it. If you prefer to post it, please find enclosed a self-addressed envelope).

I really appreciate your cooperation.

Yours sincerely

Signed by candidate

Mrs S Oosthuizen

Appendix 2

Questionnaire

Assessment of Computer Mediated Communication (CMC) and the role of e-mail at the University of Fort Hare and the University of Port Elizabeth.

Official use only: **UFH no……..**
UPE no:……..

Mrs S Oosthuizen **September 2001**

Name of Institution: …… Faculty: …… Department: ……	Date:……..
A: Demographic profile	
1. Please state your age:	1 [ ]
2. Please indicate your gender: 2.1 Male 2.2 Female	 1 [ ] 2 [ ]
3. Please indicate your position within the university 3.1 Professor 3.2 Associate Professor 3.3 Senior Lecturer 3.4 Lecturer 3.5 Junior Lecturer 3.6 Other (Please specify) …… …… ……	 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6 [ ]
4. How long have you been working at this particular university? 4.1 0 - 5 years 4.2 6 - 10 years 4.3 11 - 40 years	 1 [ ] 2 [ ] 3 [ ]

B. Status of Information Technology	
5. Do you have a personal computer in your office? 5.1 Yes 5.2 No	 1 [ ] 2 [ ]
6. Are you familiar with e-mail? 6.1 Yes 6.2 No	 1 [ ] 2 [ ]
7. Do you have access to e-mail? 7.1 Yes 7.2 No If your answer is **No (7:2)**, you do not need to complete the rest of this questionnaire.	 1 [ ] 2 [ ]
8. If your answer to **7** is **Yes (7:1)**, do you have access to e-mail: 8.1 At home 8.2 At work 8.3 Both 8.4 No e-mail	 1 [ ] 2 [ ] 3 [ ] 4 [ ]
9. If you use e-mail, how long have you been using it? 9.1 0 - 5 Years 9.2 6 - 10 years 9.3 10 years and more	 1 [ ] 2 [ ] 3 [ ]
10. What type of e-mail system do you use? 10.1 Pegasus mail 10.2 Microsoft Outlook 10.3 Combination (Pegasus & Microsoft Outlook) 10.4 Not applicable 10.5 Other (Please specify)	 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

11. Have you ever received any basic training in the use of e-mail? 11.1 Yes 11.2 No 11.3 Not applicable	 1 [ ] 2 [ ] 3 [ ]
12. If the answer to 11 is **Yes (11.1)**, which of the following did you learn in your training, 12.1 Basic 12.2 Advanced 12.3 None	 1 [ ] 2 [ ] 3 [ ]
13. How do you rate the network at your institution?	Good [ ] Average [ ] Poor [ ] Uncertain [ ]
14. How do you rate the information technology support at your university?	Good [ ] Average [ ] Poor [ ] Uncertain [ ]
15. How do you rate your competency with reference to the e-mail system you are using?	Good [ ] Average [ ] Poor [ ] Uncertain [ ]
16. How do you rate the e-mail system that you are working with?	Good [ ] Average [ ] Poor [ ] Uncertain [ ]

C: Application of E-mail	
17. For which of the following purposes do you use e-mail? [Please rate your answer as a % (percentage) of your total e-mail use - to make up a 100%.] 17.1 Routine work 17.2 Private conversation 17.3 Communication with students 17.4 Communication with colleagues 17.5 Not applicable 17.6 Other purposes (Please specify)	Percentage (%) 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6 [ ] 100%

18. If your answer to **17.3** (Communication with students) is affirmative, i.e. you use e-mail to communicate with your students, indicate for what purposes [Please rate your answer as a % (percentage) of your total e-mail use to make up a 100%.]:	Percentage (%)
18.1 Routine 18.2 Teaching 18.3 Research 18.4 Not applicable 18.5 Other purposes (Please specify)	1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 100%
19. If your answer to **17.4** (Communication with colleagues) is affirmative, i.e. you use e-mail to communicate with your colleagues, please indicate the ratio of communication with the following categories of colleagues [Please rate your answer as a % (percentage) of the total for Q.19 - to make up a 100%.]	Percentage (%)
19.1 Communicate with other academics outside South Africa (international level) 19.2 Communicate with academics in South Africa (nationally level) 19.3 Communicate with colleagues within the university about research 19.4. Communicate via a network with academics in a specific research field (e.g scholarly communications network). 19.5. Not applicable	1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 100%

20.1. If you use e-mail to communicate with academics/colleagues outside South Africa (internationally), please indicate for what purposes [Please rate each answer as a % (percentage) of the total for Q.20.1 to make up a 100%.]	Percentage (%)
20.1.1 To exchange information	1 [ ]
20.1.2 Collaboration	2 [ ]
20.1.3 Friendship	3 [ ]
20.1.4.Not applicable	4 [ ]
20.1.5 Other purposes (Please specify)	5 [ ] 100%
20. 2. If you use e-mail to communicate with academics / colleagues in South Africa (nationally), please indicate for what purposes [Please rate each answer as a % (percentage) of the total for Q.20.2 to make up a 100%.]	
20.2.1 Exchange of information	1 [ ]
20.2.2 Collaboration	2 [ ]
20.2.3 Friendship	3 [ ]
20.2.4 Not applicable	4 [ ]
20.2.5 Other purposes (Please specify)	5 [ ] 100%
20.3 If you use e-mail to communicate with colleagues within your university, please indicate for what purposes [Please rate each answer as a % (percentage) of the total for Q.20.3 to make up a 100%.]	
20.3.1 Exchange of information	
20.3.2 Collaboration	1 [ ]
20.3.3 Friendship	2 [ ]
20.3.4 Not applicable	3 [ ]
20.2.5 Other purposes (Please specify)	4 [ ] 5 [ ]
20.4. If you use e-mail to communicate about research with colleagues linked together in a network in a specific research field (e.g. scholarly communications network), please indicate for what purposes [Please rate each answer as a % (percentage) of the total for Q.20.4 to make up a 100%.]	100%
20.4.1 Exchange of information	1 [ ]
20.4.2 Collaboration	2 [ ]
20.4.3 Friendship	3 [ ]
20.4.4 Not applicable	4 [ ]
20.4.5 Other purposes (Please specify)	5 [ ] 100%

21. With specific reference to the role of e-mail in research, please elaborate what that role is. [Please rate each answer as a % (percentage) of the total for Q.21 - to make up a 100%.]		
21.1 To find information	1 [ ]	
21.2 Collaboration	2 [ ]	
21.3 Transfers file	3 [ ]	
21.4 Communicate with your students about their research	4 [ ]	
21.5 Communicate with your supervisor about your personal research	5 [ ]	
21.6 Not applicable	6 [ ]	
21.7 Other purposes (Please specify):	7 [ ]	
.....	100%	
.....		
.....		
22. How often do you use e-mail for research?		
22.1 1 - 10 times a week	1 [ ]	
22.2 11 – 20 time a week	2 [ ]	
22.3 More than 20 times a week.	3 [ ]	
22.4 Never	4 [ ]	
23. If you do not use e-mail for research please indicate why not: (You may indicate more than one)	Yes	No
23.1 I do not have access to e-mail	1 [ ]	1 [ ]
23.2 Network unreliable	2 [ ]	2 [ ]
23.3 Not applicable	3 [ ]	3 [ ]
23.4 Other purposes (Please specify)	4 [ ]	4 [ ]
.....		
.....		
.....		
24. Do you agree or disagree with the following statements. E mail,	Yes	No
24.1 Enhances my communication with colleagues	1 [ ]	1 [ ]
24.2 Addresses information needs for research purposes	2 [ ]	2 [ ]
24.3 Increases article output	3 [ ]	3 [ ]
24.4 Increases co-authorship	4 [ ]	4 [ ]
24.5 Increases conference paper output	5 [ ]	5 [ ]
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.....		
.....		

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

NOTE: If you have any comments to make/add regarding the use of e-mail in your work environment please indicate below:

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